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THE HAWKWEEDS, OR PAINTBRUSHES

ALBERT A. HANSEN

Agronomist in Weed Investigations

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UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 130

Contribution from the Bureau of Plant Industry
(Office of Forage-Crop Investigations)
WM. A. TAYLOR, Chief

Washington, D. C.

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630 443d No. 130-151 THE HAWKWEEDS, OR PAINTBRUSHES.

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DESCRIPTIONS.

There are a number of species of hawkweeds introduced into the United States that may be considered as weeds, three of which are noxious. The hawkweeds are usually most troublesome in pastures and hayfields and are found only occasionally on cultivated land. The three noxious species are the following:

ORANGE HAWKWEED.

Orange hawkweed¹ is also known as devil's-paintbrush, red daisy, flameweed, devil's-weed, and grim-the-collier (fig. 1). It was first introduced from Europe into New England because of its attractive flame-colored flowers. Originally a garden ornamental, the plant escaped its bounds and has established itself as one of the worst pasture and hayfield weeds of New England, New York, and Pennsylvania.

Orange hawkweed is recognized by its matted hairy leaves and handsome flowers, each about an inch in diameter and usually red on the margin, merging into an orange-colored center. The flowering branches, or shoots, grow from a few inches to 2 feet in height; they are leafless and covered with stiff black hairs. The plant becomes a perennial through its creeping aboveground and underground stems. It possesses two important means of reproduction: (1) The runners, forming new plants in a manner similar to strawberry runners (fig. 1, A), and (2) the seeds, which are wind distributed (fig. 1, B).

Orange hawkweed is a weed principally in permanent meadows and grasslands and is seldom troublesome in rich soil.

¹ *Hieracium aurantiacum*.



FIG. 1.—A, Orange hawkweed, or devil's-paintbrush (*Hieracium aurantiacum*). Note the runners, from which new plants arise. B, A single seed of orange hawkweed, showing the pappus (p), which enables the wind to carry the seed.

KING-DEVIL.

King-devil¹ is a noxious weed in northern New York, in New England, and in southern Canada. This species is also called yellow hawkweed, high hawkweed, and yellow paintbrush. It was introduced from Europe into northern New York about 1879, whence it spread rapidly northward. It differs from orange hawkweed (1) in size, being usually larger; (2) in the color of its flowers, which are about the same shade of yellow as buttercups; and (3) in having smooth, hairless stems. The plants are slender in appearance, growing up to 3 feet in height. King-devil possesses methods of reproduction similar to orange



FIG. 2.—Yellow field hawkweed (*Hieracium pratense*) growing in a Virginia pasture.

hawkweed, although the runners are shorter and thicker and usually below ground. The species is common in fields, pastures, and along roadsides and resembles orange hawkweed in that it rarely invades rich soils.

YELLOW FIELD HAWKWEED.

The yellow field hawkweed² (fig. 2) is also known as yellow devil, yellow paintbrush, and king-devil. It differs from the previous species in two important particulars: (1) It is noxious principally in the high-land sections of Virginia, West Virginia, and North Carolina, although it occurs from New England to Georgia; and (2) it is destructive in rich pasture lands and may even invade cultivated fields.

The yellow field hawkweed is a comparatively recent importation from Europe, but it has spread rapidly. The plant is a coarse, hairy

¹ *Hieracium florentinum*.

² *Hieracium pratense*.

perennial with matted basal leaves somewhat resembling those of buckhorn, from the center of which arises an upright leafless shoot covered with short black hairs surmounted by a number of yellow flowers, each about three-quarters of an inch in diameter. The flowers appear from early in June until late in September. The length of the stem varies from 2 to 24 inches, according to whether it has been grazed off or mown or allowed to grow undisturbed. As with both orange hawkweed and king-devil, the yellow hawkweed reproduces by seeds capable of being distributed by the wind. New plants are also formed on runners, in a manner similar to the king-devil, although the runners differ from those of orange hawkweed in being mainly below ground.

ERADICATION.¹

Where the hawkweeds occur on poor pasture lands, it is sometimes questionable whether the expense of eradication is justifiable, particularly since these weeds will frequently "run themselves out" in five to eight years.

It is often advisable to turn poor pasture land badly infested with hawkweeds into a farm wood lot, thereby deriving some revenue from the timber and avoiding the expense of eradication.

Where the land is sufficiently fertile to support a good stand of grass and it is desirable to eradicate the hawkweed, the methods described below are applicable.

DRY SALTING.

Dry salt scattered broadcast on infested land will tend to kill the hawkweeds. It should be applied during the late fall at the rate of not less than 2 tons per acre. Dry salt scattered broadcast on the matted growth will not only help to kill the hawkweed by its physical action, but will in addition attract cattle, which in turn damage the weeds by trampling and nibbling at the flowers and young shoots. The use of salt is advisable on badly infected areas only.

GRAZING.

Cattle and sheep reject hawkweeds because of their bitter taste. In the case of some species of these weeds the covering of stiff hairs acts as a repellent to grazing animals. Pasturing with goats, however, will keep the weeds in check.

HAND METHODS.

In case the hawkweeds occur in scattered patches of small size, the simplest mode of attack is to dig them out with a hoe, spade, spud, or mattock, preferably following the spring rains, when the ground is soft. Plants so removed should be carried away and either burned or placed in a refuse pile where they can do no harm. Care should be

¹ The eradication and control methods herein suggested are based in part on field experimental work performed in cooperation with the Virginia Agricultural Experiment Station at Blacksburg, Va.

exercised to see that all the below-ground growth is removed, since even a small piece if left in the soil may develop into a new plant. Such underground growth usually extends a distance of 8 inches beyond the aboveground limit of the patches. The exposed soil marking the spots where the hawkweed formerly grew should then be heavily seeded with the best grass mixture obtainable. Constant vigilance is needed thereafter in order to prevent the seeding of any hawkweed which may have been overlooked, since the seeds are blown by the wind and a single plant may be the means of infesting large areas. The inspection of the farm for stray patches of hawkweed is best done from horseback when the plants are in flower, since they are then most readily seen.

Another method of eradicating small scattered patches of hawkweeds is to cover them with tarred or some other type of heavy paper, to the complete exclusion of light. The paper should be pegged to the ground or weighted down with stones and should cover the patches for an entire season. This method is expensive when the number of patches to be treated is large, but complete eradication is practically certain if the infested areas are well covered.

CULTIVATION.

Where the area of infestation is large, the hawkweeds may be driven out by placing the land in intertilled crops, such as corn.

IMPROVING THE TURF.

Top-dressing with manure or commercial fertilizer will tend to produce a more luxuriant growth of grass, with which the hawkweeds will have less chance to compete successfully. Do not harrow such grasslands, since harrowing merely serves to spread the weed.

SPRAYING.

Spraying with a saturated salt solution and with other chemicals has been attempted, but dry salting is simpler and better; hence the use of sprays is not recommended. Spraying at best is a hard, tedious, and expensive procedure.

PRECAUTIONARY MEASURES.

In large areas of infestation where eradication methods are not attempted, the hawkweeds should be mowed twice a year at the time when the flower heads first appear, usually in June and August. The main purpose of mowing is to prevent the maturing of seeds, since seeds are readily scattered by the wind to adjacent fields.

Preventive measures are extremely important when hawkweed is first discovered. All plants found should be destroyed immediately and their location marked. Frequent inspection should be made thereafter in order to make sure that the weeds do not reappear.

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United States Department of Agriculture,

DEPARTMENT CIRCULAR 131.

Contribution from the Bureau of Biological Survey,

E. W. NELSON, Chief.

DIRECTORY OF OFFICIALS AND ORGANIZATIONS CONCERNED WITH THE PROTECTION OF BIRDS AND GAME, 1920.¹

The object of this directory, the twenty-first annual publication in the series, is to present in convenient form the addresses of officials and organizations from whom information may be obtained concerning game conditions and the laws for the protection of wild life. It shows also the date of establishment of each State department concerned with the protection of birds, game, and other wild animals, the changes which have occurred in the organization of such departments, the publications issued by each, and the personnel.

Since the 1919 directory was issued changes in game officials have been made in Arkansas, California, Delaware, Indiana, Kentucky, Maryland, Montana, New Jersey, Oregon, Pennsylvania, Rhode Island, Texas, Washington, West Virginia, and Wisconsin; in British Columbia, New Brunswick, Ontario, and Quebec; and in Newfoundland. Four deaths have occurred in the ranks of official game conservationists: Dr. Joseph Kalbfus, who for more than two decades had been the Secretary of the Board of Game Commissioners of Pennsylvania, lost his life early in August, 1919, when an automobile in which he was returning from an official trip was struck by a train; Mr. George G. Phillips, Chairman of the Commissioners of Birds in Rhode Island, died late in the fall of 1919; Dr. C. Gordon Hewitt, Secretary of the Advisory Board on Wild Life Protection in Canada, died in the spring of 1920; and Maj. Raymond W. Pullman, Superintendent of Metropolitan Police, charged with the duty of enforcing the game laws in the District of Columbia, died in the spring of 1920; and Mr. William Dutcher, founder and president of the National Association of Audubon Societies, died July 1, 1920.

Legislative changes affecting the administration of the game laws occurred in Alabama and Massachusetts. Alabama created a department of conservation with jurisdiction over wild life and other natural resources, replacing the office of State game and fish commissioner;

¹ Previous editions of this directory have been published as circulars and documents of the Biological Survey and Department Circulars, as follows: 1900, No. 28; 1901, No. 33; 1902, No. 35; 1903, No. 40; 1904, No. 44; 1905, No. 50; 1906, No. 53; 1907, No. 62; 1908, No. 65; 1909, No. 70; 1910, No. 74; 1911, No. 83; 1912, No. 88; 1913, No. 94; 1914, unnumbered; 1915, B. S. Doc. 101; 1916, B. S. Doc. 104; 1917, B. S. Doc. 108; 1918, B. S. Doc. 109; 1919, Dept. Circular 63.

and Massachusetts abolished the commission of fisheries and game and placed the work in the department of conservation under the division of fisheries and game.

In 46 States and in Alaska the enforcement of game laws is intrusted to game commissioners, wardens, or other State officers; in Florida and Mississippi, to county wardens; and in the District of Columbia, to the Metropolitan Police. Several national organizations are interested in the protection of birds and game, of which two are international. In addition, State associations and many local organizations cooperate in the work of protecting game in 35 States and Alaska. Twenty-nine States and the District of Columbia have Audubon societies, organized especially for the study and protection of nongame birds.

The Bureau of Biological Survey requests prompt notification of any errors or changes in addresses herein, in order that necessary corrections may be made for future editions.

GEO. A. LAWYER,
Chief United States Game Warden.

FEDERAL OFFICIALS.

UNITED STATES DEPARTMENT OF AGRICULTURE.

[Jurisdiction extended to game protection by act of May 25, 1900.]

Secretary of Agriculture, E. T. Meredith, Washington, D. C.

Chief, Bureau of Biological Survey, E. W. Nelson, Washington, D. C.

Assistant Chief, Bureau of Biological Survey, W. C. Henderson, Washington, D. C.

Chief United States Game Warden, Geo. A. Lawyer, Washington, D. C.

Assistant in charge of Mammal and Bird Reservations, H. F. Stone, Washington, D. C.

Assistant in charge, Protection of Alaska Land Fur Animals, W. F. Bancroft, Washington, D. C.

Expert in Game Conservation, T. S. Palmer, Washington, D. C.

STATE OFFICIALS.

[For information respecting the game laws in States and Territories which have no State wardens, address as follows: *Alaska*—Secretary of Agriculture, Washington, D. C.; *Florida*—Secretary of State, Tallahassee; *Mississippi*—Secretary of State, Jackson; *Hawaii*—Edw. M. Ehrhorn, Honolulu.

Game laws are published in pamphlet form in all States.

For information respecting the game laws of Yukon Territory in Canada, address the Gold Commissioner, Dawson.]

ALABAMA.

Department of Conservation. Office of State Game and Fish Commissioner established February 19, 1907; term, four years. Department created August 14, 1919.

Commissioner, John H. Wallace, jr., Montgomery (term expires January, 1921).

Publications: Game Laws; Bulletins; Bird Day Annuals; Biennial Reports (last, 1918).

ARIZONA.

State Game Warden. Game commission established 1887; office of State game warden created 1913; term, two years.

Joe V. Prochaska, Phoenix (term expires January 1, 1921).

Publications: Game Laws; Reports.

ALASKA.

[The governor appoints wardens, licenses guides on the Kenai Peninsula, and issues hunting and shipping licenses.]

Game Warden. Office established May 11, 1908; appropriation first available July 1, 1909; term, pleasure of governor.

Governor, Thomas Riggs, jr., Juneau.

Wardens, J. A. Baughman, Seward; E. A. Young, Chitina; A. E. Lucy, Ket-chikan; M. O. Solberg, Nome; Robert E. Steel, Eagle; F. A. Martin, Anchorage; Stephen R. L. Foster, Nenana; J. C. Lund, Juneau; L. F. Protzman, Fairbanks; Charlie Klontech, Sitka.

Publications: Annual Reports (last, 1919).

ARKANSAS.

Game and Fish Commission. Established March 11, 1915; term, four years.

Chairman, D. G. Beauchamp, Paragould (term expires March, 1923).

C. C. Calvert, Fort Smith (term expires March, 1923).

Dr. Horatio Wells, Monticello (term expires March, 1921).

Lee Miles, Little Rock (term expires March, 1923).

J. V. Walker, Fayetteville (term expires March, 1921).

Secretary, Miss Nellie Patton, Little Rock.

Chief game warden, _____.

Office of the commission, State Capitol, Little Rock.

Publications: Game and Fish Laws; Reports (last, 1918).

CALIFORNIA.

Board of Fish and Game Commissioners. Board of fish commissioners established April 2, 1870; jurisdiction extended to game 1878; title changed 1909; term, pleasure of governor.

President, F. M. Newbert, Forum Building, Sacramento.

M. J. Connell, Union League Building, Los Angeles.

E. L. Bosqui, 215 Leidesdorff Street, San Francisco.

Executive officer, Chas. A. Vogelsang, Postal Telegraph Building, San Francisco.

Office of the board, Postal Telegraph Building, San Francisco.

Publications: Fish and Game Laws; Quarterly Bulletin; Biennial Reports (last, 1918).

COLORADO.

State Game and Fish Commissioner. Office of State fish commissioner established March 10, 1877; jurisdiction extended to game 1891. Present office established April 27, 1899;² term indefinite—under civil service.

Roland G. Parvin, State Capitol, Denver.

Deputy commissioner, J. L. Gray, Fort Collins.

Publications: Game and Fish Laws; Biennial Reports.

CONNECTICUT.

State Board of Fisheries and Game. Appointment of commissioners on fisheries first authorized in 1867; jurisdiction extended to game April 30, 1895; reorganized, 1913; term, four years.

President, William K. Mollan, Bridgeport (term expires 1922).

Vice president, Frederick N. Manross, Forestville (term expires 1921).

Secretary, Charles H. Pease, Canaan (term expires 1921).

Philip C. Arnold, Haddam (term expires 1921).

J. H. McLaughlin, Jewett City (term expires 1921).

Gen. John W. Atwood, Wauregan (term expires 1922).

Dr. Leonard C. Sanford, New Haven (term expires 1922).

William McMullen, Somersville (term expires 1922).

Superintendent, John M. Crampton, Room 64, State Capitol, Hartford.

Office of the commission, Room 64, State Capitol, Hartford.

Publications: Fish and Game Laws; Biennial Reports (last, 1918).

² From 1897 to 1899 the title was State Forest, Game, and Fish Commissioner.

DELAWARE.

*Board of Game and Fish Commissioners.*³ Established March, 1911; term, six years.
 President, Edward G. Bradford, jr., Wilmington (term expires September, 1923).
 Vice president, William H. Reed, Dover (term expires September, 1925).
 Secretary and treasurer, H. C. Davis, Laurel (term expires September, 1921).
 Chief game and fish warden, John P. Le Fevre, Dover.

Publications: Game and Fish Laws; Biennial Reports.

DISTRICT OF COLUMBIA.

*Metropolitan Police.*⁴ Superintendent, Maj. H. L. Gessford, Washington.
 Lieut. Russel Dean, commanding river patrol boat, Washington.

GEORGIA.

Department of Game and Fish. Office established August 21, 1911; term, two years.
 Commissioner, S. J. Slate, Atlanta (term expires September 1, 1921).
Publications: Fish and Game Laws; Bulletins; Annual Reports.

IDAHO.

Department of Law Enforcement. Office of fish and game warden established March 13, 1899. Department established February 19, 1919, and fish and game bureau established March 14, 1919.

Fish and Game Bureau:

State fish and game warden, Otto M. Jones, Boise (term expires December 31, 1921).
 Chief deputy, D. P. Rich, Boise.

Publications: Fish and Game Laws; Biennial Reports (last, 1918).

ILLINOIS.

Department of Agriculture. Office of State game commissioner established April 24, 1899; game and fish conservation commission established July 1, 1913; game and fish commission established July 1, 1915; present department established July 1, 1917.

Director of agriculture, Charles Adkins, Springfield (term expires January, 1921).
 Chief game and fish warden, Ralph F. Bradford, Springfield (term expires January, 1921).

Office of the department, State Capitol, Springfield.

Publications: Game and Fish Laws; Annual Reports.

INDIANA.

Department of Conservation. Office of commissioner of fisheries established in 1881; jurisdiction extended to game, birds, and fur-bearing animals, February 13, 1899.

Department of conservation (4 members), created March 11, 1919; term, four years.

Chairman, W. A. Guthrie, State House, Indianapolis.

Director (executive of department), Richard Lieber, State House, Indianapolis (term pleasure of commissioners).

Division of Fish and Game:

Superintendent, Geo. N. Mannfeld, State House, Indianapolis.

Publications: Laws relating to natural resources, including fish and game laws; Year Book; and special bulletins and findings.

IOWA.

State Fish and Game Warden. Office established October 1, 1897; term, three years.

W. E. Albert, Lansing (term expires March 31, 1922).

Publications: Fish and Game Laws; Biennial Reports (last, 1918).

State Board of Conservation. Created under act of April 12, 1917, to investigate and acquire sites for public State parks and otherwise conserve the wild life of the State.

Chairman, Dr. L. H. Pammel, Ames.

Joseph Kelso, Jr., Bellevue.

John F. Ford, Fort Dodge.

Secretary, Edgar R. Harlan, Des Moines.

³ From 1879 to 1911 the enforcement of the game laws was intrusted to the Delaware Game Protective Association.

⁴ Has jurisdiction over matters pertaining to game.

KANSAS.

State Fish and Game Warden. Office of commissioner of fisheries established 1877. Present office established July 1, 1905; term, four years.
Alva Clapp, Pratt (term expires April 18, 1923).
Publications: Fish and Game Laws; Bulletins; Biennial Reports.

KENTUCKY.

Game and Fish Commission. Established March 12, 1912; term, four years.
Chairman, Joseph G. Sachs, Sachs' Law Building, Louisville (term expired June, 1920).
Thomas H. Clay, Austerlitz (term expired June, 1920).
Alanson Trigg, Glasgow (term expires June, 1922).
J. E. Crider, jr., Fredonia (term expires June, 1922).
Executive agent, Dr. R. S. Tuttle, Frankfort (term expired June, 1920).
Publications: Fish and Game Laws; Biennial Reports (last, 1919).

LOUISIANA.

Department of Conservation. Originally established as the board of commissioners for the protection of birds, game, and fish, July 9, 1908. Conservation commission established July, 1912; reorganized as a department of conservation, 1916; term, four years.
Commissioner, M. L. Alexander, New Orleans (term expires August, 1920).
Office of the commissioner, Court Building, New Orleans.
Publications: Fish, Oyster, Game, Mineral, and Forestry Laws; Economic Bulletins; Biennial Reports (last, 1920).

MAINE.

Commissioner of Inland Fisheries and Game. Appointment of commissioners of fisheries authorized February 21, 1878; jurisdiction extended to game 1880; commissioners of inland fisheries and game established March 8, 1899; present office of commissioner established July 7, 1917; term, three years.
Willis E. Parsons, State House, Augusta (term expires February 13, 1921).
Publications: Fish and Game Laws; Annual Reports.

MARYLAND.

Conservation Commission. Office of game warden established April 4, 1896; reorganized April 10, 1904. Present commission established June 4, 1916; term, four years.
Chairman, Harrison W. Vickers, Chestertown (term expires 1924).
Edward O. Weant, Westminster (term expires 1924).
Edmund J. Plowden, Bushwood (term expires 1924).
State game warden, E. Lee Le Compte, 512 Munsey Building, Baltimore (term expires June, 1922).
Chief deputy game warden, Chas. F. Smith, Baltimore.
Office of the commission, 512 Munsey Building, Baltimore.
Publications: Fish and Game Laws; Annual Reports.

MASSACHUSETTS.⁵

Department of Conservation. Organized as commissioners of fisheries in 1865; jurisdiction extended to game 1886. Present department created July 23, 1919.
Commissioner, Wm. A. L. Bazeley, State House, Boston (term expires December 1, 1920).
Division of Fisheries and Game:
Director, Wm. C. Adams, State House, Boston (term expires December 20, 1920).
Publications: Fish and Game Laws; Annual Reports (last, 1919).

MICHIGAN.

Public Domain Commission. Game and fish warden department established March 15, 1887; jurisdiction extended to forestry, and department reorganized in 1907; placed under jurisdiction of public domain commission in 1915.
Game, Fish, and Forest Fire Department:
Commissioner, John Baird, Lansing (term expires June 30, 1923).
Chief deputy, David R. Jones, Lansing (term expires July 1, 1920).
Publications: Biennial Reports (last, 1917-18); Game and Fish Laws (published by secretary of state).

⁵ The first wardens were apparently the special officers to protect deer authorized under the acts of 1739 (chap. 3, sec. 4) and 1764 (chap. 28, sec. 3). In the latter act they were called "deer reeves."

MINNESOTA.

State Game and Fish Commissioner. Appointment of commissioner of fisheries originally authorized March 5, 1874. Office of (State) game warden created March 8, 1887; term, four years. Board of game and fish commissioners established April 20, 1891; reorganized 1901. Office of State game and fish commissioner established August 1, 1915; term, four years.

Carlos Avery, State Capitol, St. Paul (term expires August 1, 1923).

Publications: Game and Fish Laws; Bulletins; Biennial Reports (last, 1918).

MISSOURI.

Game and Fish Commissioner. Office of game and fish warden established April 8, 1895; reorganized June 17, 1905; term, two years. Present office established August 16, 1909; term, four years; fish commission abolished and game and fish commissioner authorized to perform its duties in 1919.

Timothy Birmingham, Jefferson City (term expires August, 1923).

Publications: Game and Fish Laws; Annual Reports.

MONTANA.

Game and Fish Commission. Board of game and fish commissioners established March 14, 1895. Replaced by State game and fish warden March 18, 1901. Present commission established March 13, 1913; term, four years.

Chairman, J. L. Kelley, Anaconda (term expires March 13, 1921).

Secretary and State game warden, J. L. De Hart, Helena (term expires April, 1921).

Nelson Story, jr., Bozeman (term expires March 13, 1923).

M. D. Baldwin, Kalispell (term expires March 13, 1921).

Thos. N. Marlowe, Missoula (term expires March 13, 1923).

Publications: Game and Fish Laws; Biennial Reports (last, 1918).

NEBRASKA.

Game and Fish Commission. Established July 1, 1901; term, two years.

Commissioner, Gov. Samuel R. McKelvie, Lincoln (term expires January, 1921).

Chief deputy, George G. Koster, Lincoln (term expires January, 1921).

Publications: Game and Fish Laws; Biennial Reports (last, 1918).

NEVADA.

State Fish and Game Warden. Established March 27, 1917; term, four years.

C. W. Grover, Carson City (term expires April 1, 1921).

Publications: Fish and Game Laws.

NEW HAMPSHIRE.

Fish and Game Commissioner. Original fish commission established June 30, 1865.

Board of fish and game commissioners established 1878; term, five years. Present office established June 1, 1913; term, three years.

Mott L. Bartlett, Sunapee (term expires June 1, 1922).

Chief clerk, Chas. B. Clarke, State House, Concord.

Publications: Game and Fish Laws; Biennial Reports (last, 1918).

NEW JERSEY.

Board of Fish and Game Commissioners. Appointment of commissioners of fisheries first authorized March 17, 1870; jurisdiction extended to game 1894. Board of fish and game commissioners established March 22, 1895; reorganized 1917; term, five years.

President, Ernest Napier, East Orange (term expires November 26, 1922).

Treasurer, William A. Logue, Bridgeton (term expires November 25, 1925).

Wm. B. Boulton, Morristown (term expires November 25, 1924).

Jasper Lynch, Lakewood (term expires March 23, 1922).

Amos H. Radcliffe, Paterson (term expires March 23, 1922).

Robertson S. Ward, East Orange (term expires March 23, 1922).

Alex. H. Phillips, Princeton (term expires November 25, 1923).

Secretary, Walter H. Fell, Trenton.

Fish and game protector, James M. Stratton, North Long Branch.

Office of the board and of the secretary, State Capitol, Trenton.

Publications: Fish and Game Laws; Annual Reports.

NEW MEXICO.

Department of Game and Fish. Office of game and fish warden established March 12, 1903; term, two years. Department created June 14, 1912.
Game and fish warden, Thomas P. Gable, Santa Fe (term expires 1921).
Chief deputy, J. M. Larrazola, Santa Fe.
Publications: Fish and Game Laws; Biennial Reports (last, 1918).

NEW YORK.

Conservation Commission. Originally established as a commission of fisheries in 1868. Office of chief game and fish protector created in 1888. Forest, fish, and game commission established in 1895 and reorganized March 12, 1901. Department of conservation established July 12, 1911; term, six years. Reorganized April 16, 1915, under one commissioner.
Commissioner, George D. Pratt, Albany (term expires December 31, 1920).
Deputy commissioner, Alexander Macdonald, St. Regis Falls.
Secretary, Warwick S. Carpenter, Albany.
Chief game protector, Llewellyn Legge, Albany.
Office of the commission, 158 State Street, Albany.
Publications: Conservation Laws, including Forest, Fish, and Game Laws; Maps; Annual Reports (last, 1919); bulletins on forestry, wild life, and water power; The Conservationist.

NORTH CAROLINA.

*Audubon Society of North Carolina.*⁶ Organized March 11, 1902; incorporated March 6, 1903.
President, Dr. R. H. Lewis, Raleigh.
Secretary, P. H. Underwood, 512 Tucker Building, Raleigh.
Publications: Local Game Laws; Circulars.

NORTH DAKOTA.

Game and Fish Board. Established April 1, 1909; reorganized April 1, 1911; term, four years.
President, Charles MacLachlan, New Rockford (term expires April, 1921).
Vice president, C. E. Manning, Fargo (term expires April 1, 1923).
Secretary, George M. Hogue, Steele (term expires April, 1923).
Fish commissioner, J. H. Bloom, Devils Lake (term expires April, 1921).
District Game Wardens. Office originally established as State game warden in 1895; changed to district game warden in 1903.
Chief warden, District No. 1 (northern), B. J. Monaghan, Upham (term expires April 1, 1921).
Chief warden, District No. 2 (southern), W. F. Reko, Mandan (term expires April 1, 1921).
Publications: Game and Fish Laws; Biennial Reports.

OHIO.

Board of Agriculture. Appointment of commissioners of fisheries first authorized May 3, 1873; jurisdiction extended to game and commission reorganized May 17, 1886. Agricultural commission established 1913. Board of agriculture (10 members) established July 22, 1915. Secretary of board of agriculture given jurisdiction over game, birds, and fish, July 1, 1917.
Secretary and chief executive officer, N. E. Shaw, Columbus.
Fish and Game Division: Chief warden, A. C. Baxter, Columbus.
Publications: Fish and Game Laws; Annual Reports (last, 1919).

OKLAHOMA.

State Game and Fish Commission. Office of State game and fish warden established March 10, 1899; reorganized 1909; commission established July 1, 1913.
Governor, J. B. A. Robertson, Oklahoma City.
Secretary of state, Joe Morris, Oklahoma City.
State game and fish warden, Ben Watt, State Capitol, Oklahoma City.
Publications: Game and Fish Laws; Reports.

⁶ Acts as a State department and administers the game laws in the counties under its jurisdiction.

OREGON.

State Board of Fish and Game Commissioners. Office of game and fish protector established in 1893; term, two years. Game and forestry warden established February 18, 1899; term, four years. Present board established May 21, 1911; term, four years. Board reorganized in 1915 and again in 1920.

Ex officio chairman, Gov. Ben W. Olcott, Salem.

Chairman, E. V. Carter, Ashland (term, one year).

Game Commissioners:

I. N. Fleischner, Portland (term expires March 1, 1925).

Marion Jack, Pendleton (term expires March 1, 1925).

John Gill, Portland (term expires March 1, 1923).

E. C. Simmons, Eugene (term expires March 1, 1923).

C. F. Stone, Klamath Falls (term expires March 1, 1923).

State game warden, A. E. Burghdoff, Oregon Building, Portland (term expires at pleasure of board).

Publications: Game and Fish Laws; Oregon Sportsman (quarterly); Annual Reports (last, 1919).

PENNSYLVANIA.

Board of Game Commissioners. Board established 1895; term, three years.

President, Dr. Charles B. Penrose, 1331 Spruce Street, Philadelphia (term expires 1921).

John M. Phillips, 2227 Jane Street, Pittsburgh (term expires 1920).

W. B. McCaleb, Harrisburg (term expires 1922).

Dr. H. J. Donaldson, Williamsport (term expires 1921).

John S. Spear, St. Marys (term expires 1920).

Wm. S. Ellis, Bryn Mawr (term expires 1922).

Secretary and chief game protector, Seth E. Gordon, Harrisburg.

Office of the board, Franklin Building, Harrisburg.

Publications: Game, Fish, and Forestry Laws; Bulletins; Annual Reports (last, 1919).

RHODE ISLAND.

Commissioners of Birds. Commission established June, 1899; term, three years.

Chairman, Everett L. Walling, 1022 Hospital Trust Building, Providence.

E. W. Kent, Newport.

Prof. John Barlow, Kingston.

Alexander G. Fales, Bristol.

Byron A. Northrup, Anthony.

All terms expire January 31, 1923.

Publications: Game Laws; Annual Reports (last, 1919).

SOUTH CAROLINA.

Chief Game Warden. Office established February 25, 1910; term, four years.

W. H. Gibbes, Columbia (term expires April 1, 1921).

Publications: State Game Laws; Annual Reports (last, 1919).

SOUTH DAKOTA.

State Game and Fish Commission. Office of State game warden established July 1, 1909; term, two years. Commission established July 1, 1913.

Chairman, Gov. Peter Norbeck (term expires January, 1921).

Attorney general, Byron S. Payne, Pierre (term expires January, 1921).

State game warden, H. S. Hedrick, Pierre (term expires July 1, 1921).

Publications: Game Laws; Annual Reports (last, 1919).

TENNESSEE.

State Game and Fish Warden. Office of State warden established April 11, 1903; department of game, fish, and forestry established April 15, 1905; term, eight years; department of game and fish established May 17, 1915.

W. D. Howser, Nashville (term expires April 17, 1921).

Publications: Game and Fish Bulletins; Reports (last, 1919).

TEXAS.

Game, Fish, and Oyster Commissioner. Office of fish and oyster commissioner established 1895; jurisdiction extended to game in 1907, in 1911 to control and sale of sand and shell in public coastal waters, and in 1919 to gravel and sand in all inland public waters; term, two years.

J. R. Jefferson, Austin (term expires 1921).

Chief deputy, _____.

Publications: Game, Fish, Oyster, Sand, Shell, and Gravel Laws; Reports.

UTAH.

State Fish and Game Commissioner. Office established 1890; reorganized in 1897 and 1899;⁷ term, four years.

R. H. Siddoway, Capitol Building, Salt Lake City (term expires March 15, 1921).

Publications: Fish and Game Laws; Biennial Reports (last, 1918).

VERMONT.

Fish and Game Commissioner. Fish commission established in 1867; reorganized as a fish and game commission November 22, 1892. Present office established December 7, 1904; term, two years.

Linus Leavens, Montpelier (term expires February 1, 1921).

Publications: Fish and Game Laws; Biennial Reports (last, 1918).

VIRGINIA.

Department of Game and Inland Fisheries. Office of commissioner of fisheries established 1875; jurisdiction extended to game and department of game and inland fisheries organized March 11, 1916.

Commissioner, F. Nash Bilisoly, Richmond.

Chief clerk, M. D. Hart, Richmond.

Office of commission, 6-8 North 6th Street, Richmond.

Publications: Game and Fish Laws; Reports (last, 1919).

WASHINGTON.

State Fish Commissioner and State Game Warden. Office of game warden established February 6, 1890. State fish commissioner made game warden March 13, 1899.

Office reorganized March 19, 1913; term, four years.

L. H. Darwin, Box 384, Seattle (term expires April 1, 1922).

Chief deputy, Frank Bryant, Yakima.

Publications: Game, Fish, and Trapping Laws; Annual Reports.

WEST VIRGINIA.

Forest, Game, and Fish Warden. Office of game and fish warden established May 18, 1897; reorganized 1909; term, four years.

Clare W. Harding, Elkins (term expires February 20, 1922).

Chief deputy, Garfield Skidmore, Elkins (term expires February 20, 1922).

Chief deputy, J. M. England, Athens (term expires February 20, 1922).

Publications: Game and Fish Laws; Biennial Reports (last, 1918).

WISCONSIN.

State Conservation Commission. Office of State fish and game warden established May 5, 1891; present commission established July, 1915 (term, six years).

Chairman, W. E. Barber, Madison (term expires February, 1925).

James Nevin, Madison (term expires February, 1921).

C. L. Harrington, Madison (term expires February, 1923).

Secretary, R. S. Scheibel, Madison.

Publications: Game and Fish Laws; The Conservationist (bi-monthly); Biennial Reports (last, 1918).

⁷ From 1897 to 1899 the title of the office was State fish and game warden.

WYOMING.

State Game Commission. Office of fish commissioner established 1879,⁸ jurisdiction extended to game 1895. Office of State game warden established February 15, 1899; term, four years. Present commission established February 18, 1911. President, Gov. Robert D. Carey, Cheyenne (term expires January, 1923). Secretary of state, Wm. E. Chaplin, Cheyenne (term expires January, 1923). State auditor, I. C. Jefferis, Cheyenne (term expires January, 1923). State game warden, William T. Judkins, Cheyenne (term expires February 22, 1923). *Publications:* Game and Fish Laws; Annual Reports (last, 1919).

CANADA.

Advisory Board on Wild Life Protection (Interdepartmental). Established December 28, 1916. Advises in the administration of the northwest game act and the migratory birds convention act, and also advises the Dominion Government on questions affecting the conservation of wild life generally; assists Provincial governments wherever possible and promotes cooperative measures between governments.

Chairman, James White, Commissioner of Conservation, Ottawa.

Acting Secretary, Hoyes Lloyd, Dominion Parks Branch, Department of the Interior, Ottawa.

D. C. Scott, Department of Indian Affairs, Ottawa; Dr. R. M. Anderson, Geological Survey, Ottawa; J. B. Harkin, Commissioner of Dominion Parks, Department of the Interior, Ottawa.

Dominion Parks Branch, Department of the Interior, Ottawa. Administers the migratory birds convention act.

Commissioner, J. B. Harkin.

Ornithologist and supervisor of wild life protection, Hoyes Lloyd.

Publications: Migratory Birds Convention Act and Regulations; Pamphlets.

ALBERTA.

*Department of Agriculture.*⁹ Office of chief game guardian established 1905.¹⁰

Minister, Duncan Marshall, Edmonton.

Deputy minister, H. A. Craig, Edmonton.

Chief game guardian, Benjamin Lawton, Edmonton.

Publications: Game Laws; Annual Reports.

BRITISH COLUMBIA.

Game Conservation Board. Office of Provincial game and forest warden established 1905; titled changed to Provincial game warden 1909; present board established by act of 1918, as amended in 1919, and game department placed under the superintendent of Provincial police, who becomes also ex officio Provincial game warden.

Chairman, Dr. A. R. Baker, Vancouver.

Secretary, R. E. Hose, Vancouver.

Provincial game warden, Wm. G. McMyynn, Victoria.

F. A. Dunn, Cranbrook.

Office of the board, courthouse, Vancouver.

Publications: Game Laws; Bulletins.

MANITOBA.

*Department of Agriculture and Immigration.*⁹ Office of chief game guardian established August, 1898.

Minister, Valentine Winkler, Winnipeg.

Chief game guardian, Charles Barber, Winnipeg.

Publications: Game Protection Act; Annual Reports.

NEW BRUNSWICK.

*Crown Land Department.*⁹ Office of chief game commissioner established 1878; change to chief wardens made in 1909; one chief warden, 1913.

Minister lands and mines, Dr. E. A. Smith, Shediac.

Deputy minister lands and mines, T. G. Loggie, Fredericton.

L. A. Gagnon, chief game and fire warden, Fredericton.

Publications: Game Laws; Annual Reports.

⁸ From 1882 to 1884 the duties were performed by a board of six fish commissioners.

⁹ Has jurisdiction over matters pertaining to game.

¹⁰ Prior to 1905 the duties were performed by the chief game guardian of the Northwest Territories, an officer first appointed in 1902.

NORTHWEST TERRITORIES.

Dominion Parks Branch, Department of the Interior, Ottawa, administers the north-west game act. (See also Advisory Board on Wild Life Protection (Interdepartmental), p. 10.)

Commissioner, J. B. Harkin.

Ornithologist and supervisor of wild life protection, Hoyes Lloyd.

Publications: Northwest Game Act.

NOVA SCOTIA.

Board of Game Commissioners Established April 16, 1908. (Duties formerly exercised by Nova Scotia game and inland fishery protection society.)

Chief game commissioner, J. A. Knight, K. C., St. Paul Building, Halifax.

Associate commissioners, W. W. Osborne, New Glasgow · R. S. Kelley, Yarmouth.

Publications: Game Laws; Annual Reports (last, 1919).

ONTARIO.

Department of Game and Fisheries. Office of chief game warden established 1892; office of superintendent of game and fisheries established 1907; department of game and fisheries established 1914.

Minister, F. C. Biggs, Parliament Building, Toronto.

Deputy minister, D. McDonald, Parliament Building, Toronto.

Superintendent, George H. Rapsey, Parliament Building, Toronto

Publications: Game Laws; Annual Reports (last, 1919).

PRINCE EDWARD ISLAND.

Game Inspector.¹¹ Office established April 21, 1906; term, pleasure of lieutenant governor in council.

Chief game officer, migratory birds, Maritime Provinces, Robie W. Tufts, Wolfville, Nova Scotia.

Publications: Annual Reports.

QUEBEC.

Department of Colonization, Mines and Fisheries—Fisheries and Game Branch. Office of game superintendent established June 10, 1884; reorganized in 1897 and 1906.

Minister, J. E. Perrault, Quebec.

Deputy minister, S. Dufault, Quebec.

Special (expert) officer, E. T. D. Chambers, Quebec.

General superintendent of fisheries and game, Hector Caron, Quebec.

Assistant superintendent of fisheries and game, Eug. Hamel, Quebec.

General inspector of fisheries and game, J. A. Bellisle, Quebec.

Publications: Fish and Game Laws; Annual Reports.

SASKATCHEWAN.

Department of Agriculture.¹² Office of the chief game guardian established 1905.¹³

Minister of agriculture, C. A. Dunning, Regina.

Deputy minister, F. H. Auld, Regina.

Chief game guardian, Fred Bradshaw, Regina.

Publications: Annual Reports (last, 1919).

NEWFOUNDLAND.

Game and Inland Fisheries Board. Department of marine and fisheries, with jurisdiction over matters pertaining to game, established March 10, 1898. Game and inland fisheries board authorized May 10, 1906; organized 1909; established by act of Parliament, 1910.

President, minister of marine and fisheries, Hon. W. F. Coaker, St. Johns.

Vice president, Thomas Winter, St. Johns.

First assistant vice president, Alexander McDougall, St. Johns.

Second assistant vice president, W. H. Rennie, St. Johns.

Secretary, Gower Rabbits, St. Johns.

Publications: Game Laws; Annual Reports.

¹¹ Sheriffs act as game inspectors in their respective counties.

¹² Has jurisdiction over matters pertaining to game.

¹³ Prior to 1905 the duties were performed by the chief game guardian of the Northwest Territories, an officer first appointed in 1902.

NATIONAL ORGANIZATIONS.

- ADVISORY BOARD, MIGRATORY-BIRD TREATY ACT.** Appointed September 17, 1918.
Chairman, John B. Burnham, president American game protective and propagation association, 233 Broadway, New York City; William C. Adams, director division of fisheries and game, State House, Boston, Mass.; M. L. Alexander, conservation commissioner, New Orleans, La.; Brooke Anderson, secretary Chicago camp fire club, 208 South La Salle Street, Chicago, Ill.; Carlos Avery, State game and fish commissioner, St. Paul, Minn.; W. E. Barber, chairman conservation commission, Madison, Wis.; Edward G. Bradford, jr., president board of game and fish commissioners, Wilmington, Del.; Alva Clapp, State fish and game warden, Pratt, Kans.; William L. Finley, 651 East Madison Street, Portland, Oreg.; E. H. Forbush, State ornithologist, State House, Boston, Mass.; George Bird Grinnell, president Boone and Crockett club, 238 East Fifteenth Street, New York City; Dr. Wm. T. Hornaday, director New York Zoological Park, New York City; George G. Koster, chief deputy game and fish commission, Lincoln, Nebr.; Clark McAdams, St. Louis Post Dispatch, St. Louis, Mo.; Marshall McLean, attorney New York conservation commission, Albany, N. Y.; I. S. Myers, fish and game committee, board of agriculture, Akron, Ohio; F. M. Newbert, president, board of fish and game commissioners, Forum Building, Sacramento, Calif.; Clinton M. Odell, 120 Northwestern National Life Insurance Building, Minneapolis, Minn.; T. Gilbert Pearson, secretary national association of Audubon societies, 1974 Broadway, New York City; George Shiras, 3d, Marquette, Mich.; John H. Wallace, jr., commissioner department of conservation, Montgomery, Ala.
- ADVISORY BOARD ON WILD LIFE PROTECTION (INTERDEPARTMENTAL)—CANADA.**
Established December 28, 1916. (See page 10.)
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- AMERICAN BISON SOCIETY.** Organized December 8, 1905.
President, Edmund Seymour, 45 Wall Street, New York City.
Secretary, M. S. Garretson, 8 Union Avenue, Clifton, N. J.
- AMERICAN GAME PROTECTIVE AND PROPAGATION ASSOCIATION.** Incorporated September 25, 1911.
President, John B. Burnham, 233 Broadway, New York City.
Secretary, George M. Fayles, 233 Broadway, New York City.
- AMERICAN ORNITHOLOGISTS' UNION—COMMITTEE ON PROTECTION OF NORTH AMERICAN BIRDS.** Established October 1, 1884.
Chairman, Dr. A. K. Fisher, Department of Agriculture, Washington, D. C.
- BOONE AND CROCKETT CLUB.** Founded December, 1887.
President, George Bird Grinnell, 238 East Fifteenth Street, New York City.
Acting secretary, Chas. Stewart Davison, 59 Wall Street, New York City.
Chairman, game preservation committee, Morgan Davis, 66 Broadway, New York City.
- CAMP FIRE CLUB OF AMERICA.** Organized 1903; incorporated 1904.
President, Marshall McLean, care Conservation Commission, Albany, N. Y.
Secretary, Arthur F. Rice, 15 East Fortieth Street, New York City.
- INTERNATIONAL ASSOCIATION OF GAME, FISH, AND CONSERVATION COMMISSIONERS.**
Organized July 20, 1902; reorganized February 11, 1904; organized as international association August 29, 1917.
President, J. Quincy Ward, R. D. No. 1, Cynthiana, Ky.
Secretary, Carlos Avery, St. Paul, Minn.
- NATIONAL ASSOCIATION OF AUDUBON SOCIETIES.** Organized as a national committee, April 4, 1902; incorporated January 5, 1905.
President, _____
Secretary, T. Gilbert Pearson, 1974 Broadway, New York City.
- NATIONAL EDUCATORS CONSERVATION SOCIETY.** Organized January 15, 1916.
President, Prof. Charles L. Bristol, New York University, New York City.
Secretary, Nomer Gray, High School of Commerce, 120 W. 46th Street, New York City.
- NEW YORK ZOOLOGICAL SOCIETY.** Incorporated April 26, 1895.
(This society takes an active part in the protection of birds and game.)
President, Prof. Henry Fairfield Osborn, American Museum of Natural History, New York City.
Vice president and secretary, Madison Grant, 111 Broadway, New York City.

NORTH AMERICAN FISH AND GAME PROTECTIVE ASSOCIATION. Organized January 30, 1900.

President, _____.

Senior vice president, John W. Titcomb, 379 Quail Street, Albany, N. Y.

Secretary-treasurer, E. T. D. Chambers, Quebec.

PERMANENT WILD LIFE PROTECTION FUND. Founded 1914.

Trustees, Dr. William T. Hornaday, New York Zoological Park, New York City;

A. Barton Hepburn, New York City; Clark Williams, 37 Liberty Street, New York City.

THE GAME CONSERVATION SOCIETY, INC.

Secretary, John C. Huntington, 150 Nassau Street, New York City.

STATE ORGANIZATIONS.

[Organizations not heard from in 1920 are marked with an asterisk (*).]

ALABAMA GAME AND GAME FISH PROTECTIVE ASSOCIATION.

President, George Stuart, Montgomery.

Secretary, Julius Frank, Montgomery.

*ALASKA FISH AND GAME CLUB.

President, Charles Goldstein, Juneau.

Secretary-treasurer, C. D. Garfield, Juneau.

CALIFORNIA ASSOCIATED SOCIETIES FOR THE CONSERVATION OF WILD LIFE.

President, Dr. William F. Badè, 2616 College Avenue, Berkeley.

Secretary, A. S. Kibbe, 1534 Grove Street, Berkeley.

CALIFORNIA STATE FISH, GAME, AND FOREST PROTECTIVE LEAGUE. Organized July 13, 1913.

(Formerly California Game and Fish Protective Association. Organized May 26, 1900.)

President, J. B. Hauer, 333 Pine Street, San Francisco.

Secretary, N. A. Martin, 333 Pine Street, San Francisco.

CONNECTICUT FISH AND GAME PROTECTIVE ASSOCIATION. Organized June 17, 1909 incorporated September 10, 1909.

President, George H. Scranton, New Haven.

Secretary and treasurer, H. P. Carter, Ansonia.

DELAWARE STATE SPORTSMEN'S ASSOCIATION. Organized January 30, 1912.

President, W. A. Simonton, 1048 DuPont Building, Wilmington.

Secretary, W. W. Terrill, 5054 DuPont Building, Wilmington.

FLORIDA WILD LIFE LEAGUE. Organized June 4, 1920.

President, Dr. Geo. S. Stone, Fort Myers.

Secretary, A. W. Davidson, Fort Myers.

ILLINOIS FISH AND GAME LEAGUE. Organized September 3, 1912.

President, F. M. Howk, Joliet.

Secretary, W. O. Skeels, Hinsdale.

ILLINOIS SPORTSMEN'S LEAGUE. Organized 1913.

President, H. C. Norcross, Carlyle.

Secretary, August Semmelroth, Belleville.

INDIANA FISH, GAME, AND FOREST LEAGUE. Organized October 26, 1911.

President, Walter Shirts, Noblesville.

Secretary, Andrew E. Bodine, 135 Branson Street, Marion.

IOWA CONSERVATION ASSOCIATION. Organized November 16, 1901.

President, Dr. H. S. Conard, Grinnell.

Secretary, G. B. MacDonald, Iowa State College, Ames.

IOWA FISH AND GAME CONSERVATION ASSOCIATION. Organized January 11, 1915.

President, W. O. Ewinger, Burlington.

Secretary, G. A. Begeman, Burlington.

KANSAS STATE GAME PROTECTIVE ASSOCIATION.

President, W. A. Ayres, House of Representatives, Washington, D. C.

Secretary, A. J. Applegate, 120 S. Main Street, Wichita, Kans.

- KENTUCKY FISH AND GAME PROTECTIVE ASSOCIATION. Organized February 22, 1909.
President, Thomas J. Batman, Tyler Building, Louisville.
Secretary, Eugene Stuart, Seelbach Hotel, Louisville.
- MAINE SPORTSMEN'S FISH AND GAME ASSOCIATION. Chartered 1893.
President, Merton French, Bangor.
Secretary, L. W. Somers, Bangor.
- MARYLAND STATE GAME AND FISH PROTECTIVE ASSOCIATION. Organized March 5, 1895; incorporated May 13, 1898.
President, Leonard M. Levering, 38 West Biddle Street, Baltimore.
Secretary, William H. Fisher, Stock Exchange Building, 210 East Redwood Street, Baltimore.
- MASSACHUSETTS FISH AND GAME PROTECTIVE ASSOCIATION. Chartered March 29, 1877.
(Formerly Massachusetts Anglers' Association. Chartered March 18, 1874.)
President, William A. Morse, Equitable Building, Boston.
Secretary, George W. Wiggin, 945 Tremont Building, Boston.
- MICHIGAN SPORTSMAN'S ASSOCIATION.
(Formerly Michigan Wild Life Conservation Association. Organized April 19, 1907, and reorganized January 28, 1915.)
President, Gustavus D. Pope, Detroit.
Secretary, Albert Stoll, jr., Birmingham.
- MINNESOTA GAME PROTECTIVE LEAGUE. Organized March 10, 1913.
President, Jas. A. Lawrie, Duluth.
Secretary, C. H. Dunning, Duluth.
- MISSOURI FISH AND GAME LEAGUE. Organized January 26, 1911; incorporated January 25, 1912.
President, Samuel C. Davis, Security Building, St. Louis.
Secretary, Herbert Taylor, 416 North Fourth Street, St. Louis.
- *NEBRASKA STATE SPORTSMEN'S ASSOCIATION. Organized 1876.
President, J. F. Smith, Hastings.
Secretary, George L. Carter, 425 S. 29th Street, Lincoln.
- [NEVADA] WASHOE FISH AND GAME PROTECTIVE ASSOCIATION.
(Formerly Nevada Fish and Game Protective Association. Organized February 19, 1909.)
President, H. H. Kennedy, Reno National Bank, Reno.
Secretary-treasurer, Geo. I. James, 212 North Virginia Street, Reno.
- NEW MEXICO GAME PROTECTIVE ASSOCIATION. Organized 1915.
President, Chas. Springer, Cimarron.
Secretary, Aldo Leopold, Albuquerque.
- NEW YORK ASSOCIATION FOR THE PROTECTION OF GAME. Founded May 20, 1844; incorporated 1884.
President, Col. Alfred Wagstaff, 29 Madison Avenue, New York City.
Secretary, Robert B. Lawrence, 43 Cedar Street, New York City.
- NEW YORK STATE FISH, GAME AND FOREST LEAGUE. Organized 1897; incorporated April 16, 1898.
(Formerly New York State Association for the Protection of Fish and Game. Organized 1885.)
President, Frank D. Sargent, Albany.
Secretary, L. C. Andrews, Elmira.
- NORTH DAKOTA STATE GAME PROTECTIVE ASSOCIATION. Organized 1917; incorporated March 22, 1917.
President, Joes. Crosthwaite, Mandan.
Secretary, C. E. Edquest, Mandan.
- NORTH DAKOTA STATE SPORTSMEN'S ASSOCIATION. Organized 1894.
President, Clarence H. Parker, Minot.
Secretary, R. W. Pence, Minot.
- [OHIO] LEAGUE OF OHIO SPORTSMEN. Organized February 7, 1913.
President, Hon. W. Meredith Yeatman, Cincinnati.
Secretary, J. F. Atwood, Columbus.
- OKLAHOMA STATE GAME AND FISH PROTECTIVE ASSOCIATION. Organized December 11, 1908.
President, S. H. Harris, Oklahoma City.
Secretary, J. C. Clark, 215 West 12th Street, Oklahoma City.

OREGON FISH AND GAME ASSOCIATION. Organized January 28, 1899.

President, John Gill, Third and Alder Streets, Portland.

Secretary, A. E. Gebhardt, Box 269, Portland.

OREGON SPORTSMEN'S LEAGUE. Organized March 16, 1914.

President, Dr. Arthur K. Downs, Multnomah.

Secretary and treasurer, S. C. Bartrum, Roseburg.

PENNSYLVANIA STATE SPORTSMEN'S ASSOCIATION. Organized August 22, 1890; incorporated 1892.

President, Robt. J. Gumbert, Pittsburgh.

Secretary, Frederic A. Godcharles, Milton.

[PENNSYLVANIA] UNITED SPORTSMEN OF PENNSYLVANIA. Organized April 1, 1908.

President, David Prichard, Scranton.

Corresponding secretary, S. W. Edgar, Scranton.

[PENNSYLVANIA] WILD LIFE LEAGUE OF PENNSYLVANIA. Organized January 12, 1915.

President, R. T. Brown, Elwood City.

Secretary, Jas. B. Sansom, Commercial Building, Pittsburgh.

SOUTH DAKOTA GAME AND FISH PROTECTIVE ASSOCIATION.

President, C. M. Buchanan, Mitchell.

Secretary-treasurer, H. F. Chapman, Box 846, Sioux Falls.

TENNESSEE FISH AND GAME PROTECTIVE ASSOCIATION. Organized in 1904.

President, Joseph H. Acklen, Nashville.

Secretary, O. F. Noel, Noel Block, Nashville.

TEXAS GAME AND FISH PROTECTIVE ASSOCIATION. Organized May 21, 1912.

(The original Texas Game Protection Association was organized in September, 1896.)

President, Dr. Wesley Peacock, San Antonio.

Secretary, Geo. C. Shupee, San Antonio.

[UTAH] WEBER COUNTY ROD AND GUN ASSOCIATION. Organized February 19, 1919.

President, A. T. Hestmark, Ogden.

Secretary, A. F. Larson, Ogden.

VERMONT FISH AND GAME LEAGUE. Incorporated November 21, 1890.

President, L. H. Greene, Montpelier.

Secretary, Dr. H. L. Pasche, Burlington.

[VIRGINIA] EASTERN SHORE GAME PROTECTIVE ASSOCIATION OF VIRGINIA. Organized 1893; incorporated March, 1894.

President, Dr. J. W. Bowdoin, Bloxom.

Secretary and treasurer, T. W. Blackstone, Accomac.

VIRGINIA GAME AND GAME FISH PROTECTIVE ASSOCIATION. Organized February 15, 1905; reorganized May 23, 1913.

President, Jas. Taylor Robertson, Box 1039, Richmond.

Secretary-treasurer, C. M. Hogge, Box 1039, Richmond.

WASHINGTON STATE SPORTSMEN'S ASSOCIATION. Organized 1917.

(Formerly Washington Game Protective and Propagation Association. Organized November 21, 1911.)

Chairman, Earl A. Fry, Seattle.

Secretary, R. B. Nason, 622 Bankers Trust Building, Tacoma.

*WASHINGTON STATE GAME AND FISH PROTECTIVE ASSOCIATION. Organized December 4, 1903; incorporated ———.

President, Frank A. Pontius, Seattle.

Secretary, F. L. Wilkins, County Building, Seattle.

WEST VIRGINIA FISH AND GAME PROTECTIVE ASSOCIATION. Organized November 14, 1906.

President, F. M. Glenn, Parsons.

Secretary, Calvin Price, Marlinton.

WISCONSIN GAME PROTECTIVE ASSOCIATION. Organized May 28, 1912. Incorporated, 1916.

President, Mark S. Catlin, Appleton.

Secretary-treasurer, Clarence J. Allen, Box 738, Milwaukee.

- [WISCONSIN] WILD LIFE PROTECTIVE SOCIETY. Organized February 15, 1916.
Incorporated April 16, 1917.
President, Clarence J. Allen, Box 738, Milwaukee.
Secretary, Chas. I. Foster, 534 Caswell Block, Milwaukee.
- WYOMING GAME PROTECTIVE ASSOCIATION. Organized February 4, 1916.
President, Sam W. Aldrich, Ishawooa.
Secretary, I. H. Larom, Valley.

CANADA.

- CANADIAN SOCIETY FOR THE PROTECTION OF BIRDS. Organized December 16, 1914;
incorporated January 28, 1915.
President, Frank F. Payne, Meteorological Observatory, Toronto.
Secretary, Miss Laura B. Durand, MacLean Building, 153 University Avenue,
Toronto.
- MANITOBA GAME PROTECTIVE ASSOCIATION. Organized April 2, 1905.
President, A. Code, Winnipeg.
Secretary-treasurer, J. P. Turner, 403 Merchants Bank Building, Winnipeg.
- NOVA SCOTIA GUIDES' ASSOCIATION. Organized 1909.
President, F. A. Graham, Halifax.
Secretary and treasurer, J. Allen, Yarmouth.
- ONTARIO FOREST, FISH, AND GAME PROTECTIVE ASSOCIATION. Organized June 7,
1905.
President, ———.
Secretary-treasurer, Lt. Col. A. Kelly Evans, Toronto Club, Toronto.
- PRINCE EDWARD ISLAND GAME AND FISH PROTECTIVE ASSOCIATION. Organized
September 1, 1905; incorporated April 21, 1906.
President, Albert E. Morrison, Charlottetown.
Secretary, J. A. McMillan, Charlottetown.
- [QUEBEC] PROVINCE OF QUEBEC ASSOCIATION FOR THE PROTECTION OF FISH AND
GAME. Organized February 23, 1859.
President, L. A. Amos, Montreal.
Secretary, J. R. Innes, 286 St. James Street, Imperial Bank Building, Montreal.
- [QUEBEC] SPORTSMEN'S FISH AND GAME PROTECTIVE ASSOCIATIONS OF THE PROV
INCE OF QUEBEC. Incorporated 1901.
President, John S. Thom, 123 Ramparts, Quebec.
Secretary, Charles Fremont, K. C., 81 St. Peter Street, Quebec.
- SASKATCHEWAN GAME PROTECTIVE ASSOCIATION. Organized August 10, 1906.
President, M. W. Sharon, Regina.
Secretary, W. M. Van Valkenburg, Regina.

AUDUBON SOCIETIES.¹⁴

[Organized for the study and protection of birds. Societies not heard from in 1920 are marked with an asterisk (*).]

- ARIZONA. Organized April, 1908.
President, Thomas K. Marshall, Tucson.
Secretary, Mrs. Harriet B. Thornber, Tucson.
- CALIFORNIA. Organized May 31, 1906. Incorporated April 3, 1913.
President, Wilfred Smith, Altadena.
Secretary, Mrs. Harriet Williams Myers, 311 West Avenue 66, Los Angeles.
- *COLORADO. Organized 1913.
President, Edward R. Warren, 1511 Wood Avenue, Colorado Springs.
Secretary, Miss Hattie E. Richardson, 2337 Dexter Street, Denver.
- CONNECTICUT. Organized January 28, 1898.
President, Mrs. Mabel Osgood Wright, Fairfield.
Secretary, Miss Charlotte A. Lacey, Southport.
- DELAWARE. Organized April, 1900.
President, A. D. Poole, 6 Belmont Apartments, Wilmington.
Secretary, Mrs. William S. Hilles, DuPont Building, Wilmington.

¹⁴ For National Association of Audubon Societies, see p. 12.

- DISTRICT OF COLUMBIA. Organized May 18, 1897.
President, Hon. Job Barnard, Falkestone Courts, Washington.
Secretary, Miss Helen P. Childs, Chevy Chase, Md.
- FLORIDA. Organized March 2, 1900. Incorporated 1902.
President, Mrs. Katherine B. Tippetts, St. Petersburg.
Secretary, W. Scott Way, Winter Park.
- ILLINOIS. Organized April 1, 1897.
President, Orpheus M. Schantz, 10 South La Salle Street, Chicago.
Acting Secretary, Catherine A. Mitchell, Riverside.
- INDIANA. Organized April 26, 1898.
President, M. I. Fisher, Lafayette.
Secretary, Frank C. Evans, Crawfordsville.
- KENTUCKY. Organized April 24, 1909.
President, Miss Mary Florence Taney, 309 East Third Street, Covington.
Secretary, Mrs. Frances Manser, Covington.
- KENTUCKY. Organized January 28, 1911.
President, Dr. D. J. Healy, 530 Sayre Avenue, Lexington.
Secretary, Victor K. Dodge, 173 Bell Court, West Lexington.
- MARYLAND. Organized June, 1906.
President, Mrs. Baker Hull, Washington Apartments, Baltimore.
Secretary, Jesse Slingluff, Maryland Trust Building, Baltimore.
- MASSACHUSETTS. Organized January, 1896.
President, Edward Howe Forbush, 136 State House, Boston.
Secretary-treasurer, Winthrop Packard, 66 Newbury Street, Boston.
- MICHIGAN. Organized February, 1904.
President, Mrs. Edith C. Munger, Hart.
Secretary, _____.
- MINNESOTA. Organized June 1, 1897.
President, D. Lange, 2308 Cominonwealth Avenue, St. Paul.
Secretary, _____.
- MISSISSIPPI.
President, William Hemmingway, Jackson.
Secretary, H. G. McGowan, Columbus.
- MISSOURI. Incorporated June 14, 1901.
President, Dr. Herman von Schrenk, 4276 Flad Avenue, St. Louis.
Secretary, Dr. R. J. Terry, 5315 Delmar Avenue, St. Louis.
- NEW HAMPSHIRE. Organized April 6, 1897; reorganized February 26, 1914.
President, Gen. Elbert Wheeler, Nashua.
Secretary, George C. Atwell, Strafford.
- NEW JERSEY. Organized and incorporated December 15, 1910.
President, John Dryden Kuser, Bernardsville.
Secretary-treasurer, Beecher S. Bowdish, 164 Market Street, Newark.
- NORTH CAROLINA. Organized March 11, 1902; incorporated March 6, 1903.
(See p. 7.)
- NORTH DAKOTA. Organized April, 1904; reorganized January, 1912.
President, Daniel Freeman, 711 Seventh Street, South, Fargo.
Secretary, O. A. Stevens, 1110 Tenth Street, North, Fargo.
- OHIO. Organized December 14, 1898; incorporated March 22, 1900.
President, Prof. Wm. G. Cramer, Woodward High School, Cincinnati.
Secretary, Miss Katherine Ratterman, 510 York Street, Cincinnati.
- OREGON. Organized July 1, 1902; incorporated 1909.
(Formerly John Burroughs Bird Society, organized in 1900.)
President, W. L. Finley, 651 East Madison Street, Portland.
Secretary, Dr. Emma J. Welty, 321 Montgomery Street, Portland.
- PENNSYLVANIA. Organized October, 1896.
President, Dr. Witmer Stone, Academy of Natural Sciences, Philadelphia.
Secretary, Miss Elizabeth Wilson Fisher, 2222 Spruce Street, Philadelphia.

RHODE ISLAND. Organized October, 1897.

President, Dr. H. E. Walter, Brown University, Providence.

Secretary, H. L. Madison, Park Museum, Providence.

TENNESSEE (EAST). Organized September 2, 1910.

President, Dr. Angus McDonald, 1322 Tremont Street, Knoxville.

Corresponding secretary, Miss M. M. Woodward, Knoxville.

TENNESSEE (WEST). Organized March, 1912.

President, C. C. Hanson, Union & Planters Bank Building, Memphis.

Secretary and treasurer, Mrs. S. H. Stout, 1565 Vinton Avenue, Memphis.

*TEXAS. Organized 1903.

President, Jno. F. O'Shea, Taylor.

Secretary, Miss Carrie E. Hoke, Taylor.

UTAH.

President, J. H. Paul, Salt Lake City.

Secretary, Mrs. A. O. Treganza, 624 East Sixth South Street, Salt Lake City.

*VERMONT. Organized September 2, 1901.

President, Prof. A. E. Lambert, Middlebury College, Middlebury.

Secretary, Carleton D. Howe, Morrisville.

VIRGINIA. Organized December 11, 1908.

President, M. D. Hart, Box 107, Richmond.

Secretary, Mrs. R. B. Smithey, Ashland.

WEST VIRGINIA. Organized October 24, 1911.

President, Miss Bertha E. White, 1609 Latrobe Street, Parkersburg.

Secretary, Walter Donaghho, Emerson Avenue, North Parkersburg.

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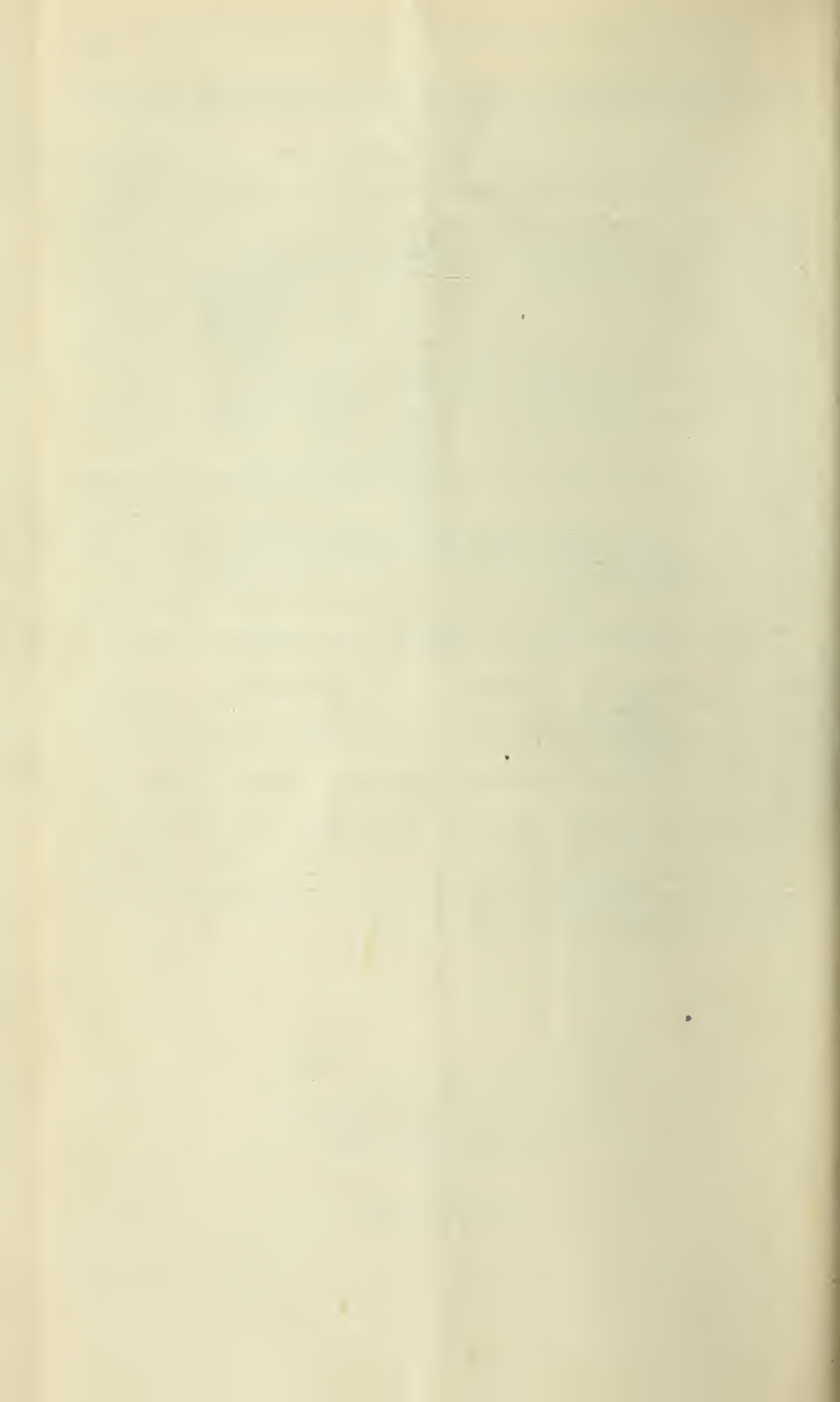
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The WASHINGTON NATIONAL FOREST



*A Vista
in the
Cascades*



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**WASHINGTON
NATIONAL
FOREST**



*A Vista
in the
Cascades*



#132 B
— A —
**MOUNTAIN
VACATION
LAND**



**BE CAREFUL
WITH FIRE**

PREVENT FOR



Mount Baker may be approached on three sides. Those wishing to reach its summit had best go in by way of the northern and southern sides.

KEEP THE FORESTS GREEN

PREVENT FOREST FIRES



Mount Baker may be approached on three sides. Those wishing to reach its summit had best go in by way of Deming, although it can also be climbed on the north and south sides.

KEEP THE FORESTS GREEN

Contribution from the Forest Service
William B. Greeley, Forester

The Washington National Forest



IN the extreme northwestern part of the United States, overlooking the restless waters of Puget Sound, which, driven by the tides of the Pacific, race backward and forward amid a constellation of beautiful islands, lies an untamed mountain wilderness—one of the few remaining strongholds of Nature. There in the Washington National Forest one may lose himself for weeks in the hills and give himself up to the full enjoyment of Nature.



"Race backward and forward amid a constellation of beautiful islands"

The Mount Baker Region

The outstanding features of the Washington National Forest are Mount Baker, unsurpassed throughout the entire Cascade Range for the magnificence and variety of its glacial formations, and the gently rolling stretches of verdant mountain meadow which blanket the summit of the divide in the Upper Skagit River region. Between them unfolds a vast uplifted wilderness, a wide-flung advance of snow-clad peaks, dotted with mirror-like lakes and separated by narrow shoe-string valleys whose sides

are gashed with narrow canyons cut by sparkling cataracts.

The excessive rainfall of the Pacific slope nourishes a dense plant and forest growth. There are few open places below an elevation of 4,500 feet, and the thick



"Between them unfolds a vast uplifted wilderness"

undergrowth, together with the roughness of the country, renders travel very difficult where there are no trails. Perhaps one-third of the northern half of the Washington Forest is above timber line. On the whole it is a richly watered region, and one singularly free from venomous insects or reptiles which might mar the enjoyment of the tourist.

There are no roads within the Washington Forest as yet. Its beauty spots are reached by trail only. It appeals to those who seek the recreational frontier. The voice of this Forest is the cry of Nature calling man from

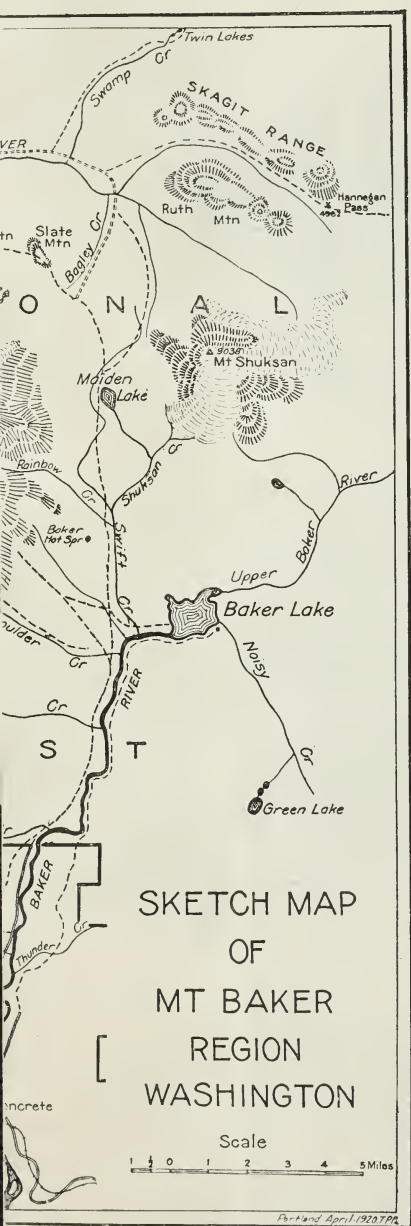


"Gently rolling stretches of verdant mountain meadows"

the common life to some of the realities of its sterner existence. It invites the tourist, but warns him not to come dressed in his parlor clothes.

Mount Baker, the "Koma Kulshan" of the Indians, known to early Spanish navigators but named by Capt.

EST FIRES



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Vancouver, is a practically extinct in height. It was first ascended by



Mount Baker

in 1861. The mountain is incrust with snow, and is surrounded by forests, a forest of evergreens, an interesting geological structure, and a fumarole, a crater.

Mount Baker is ascended on three sides. The climb was made from July 15 to September 30, August 1 to September 10.

From Glacier, on the north side of the mountain, a 2½ hours via automobile road from the town of Bellingham leads to Heliotrope Ridge, 10 miles from the town, a grassy divide of about 3 acres which is the heart of Roosevelt Glacier, with the dome of the mountain towering above it, and can be reached from this point.



"Across it on a summer evening is cast a perfect likeness of the mountain."

The road extends 7 miles east of the town of Bellingham, past the Black Falls power plant, where the river falls more than 100 feet high.

within easy walking distance from the town of Bellingham. There is a good automobile road from Deming to the mountain.



Crevasse on Mount Baker

from which the trail to the mountain is a good trail.

The mountain is a perfect point. The mountain is a perfect point. The mountain is a perfect point.

Baker is a perfect mountain. The mountain is a perfect mountain. The mountain is a perfect mountain.

Five miles to the northwest is the town of Bellingham. The sulphurous flow boiling from the subterranean spring is hidden beneath the shadow of the distant crater, at a temperature of 100 degrees Fahrenheit.



Looking into the crater of Mount Baker

Vancouver, is a practically extinct volcano 10,730 feet in height. It was first ascended by the Coleman party in 1869. The mountain is incrustated with snow and ice, surrounded by green meadows, a region of irresistible interest to the mountaineer, geologist, botanist, and nature lover. Faint sulphur fumes still rise from the crater.



Mount Baker

Mount Baker may be ascended on three sides. The climbing season runs from July 15 to September 30, August being the best month.

From Glacier, on the north side, which is reached in 2½ hours via automobile road from Bellingham, a trail leads to Heliotrope Ridge, 10 miles distant. This is a grassy divide of about 3 acres which thrusts itself into the heart of Roosevelt Glacier, with the great white dome of the mountain towering above. The summit can be reached from this point.



"Across it on a summer evening is cast a perfect likeness of the great mountain"

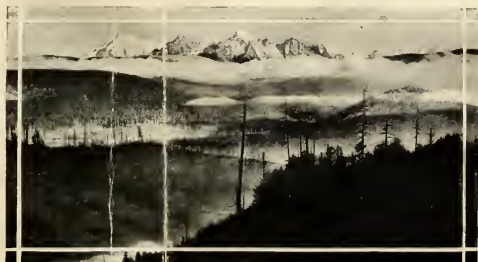
The road extends 7 miles east of Glacier to the Nooksack Falls power plant, where the river forms a cataract more than 100 feet high.

At the Three-Mile board a trail ascends to Sky Line Ridge, 6,500 feet in elevation, where it is lost in the rolling meadows, dotted with clumps of alpine fir which shield the tents of the campers.



Formations resembling cliff dwellings on the slopes of Mount Baker

Farther to the east of Nooksack Falls, 10 miles by trail, is Austin Pass, lying midway between Mount Baker and Mount Shuksan. The latter has been termed the most picturesque peak in America, while Table Mountain, at the gateway of the Chain Lakes region, is a striking formation. The scenic revel which the traveler beholds from Austin Pass will soon be made accessible by an automobile road from Glacier.



Mount Baker and the Twin Sisters

Many prefer to ascend Mount Baker from the west side at Mazama Park. Here there is a cabin shelter free to visitors, and the round trip to the summit can be made in from 8 to 12 hours. Easton and Deming Glaciers are

within easy walking distance from Mazama Park. There is a good automobile road from Deming to Heisler Ranch

from which point Mazama Park is distant 16 miles by trail.

The east side of Mount Baker is accessible from Concrete, but owing to the long distance by trail, few people ascend from this point.

Baker Lake, which has the largest sockeye salmon hatchery in the United States, is 17 miles above Concrete. Across it on the summer evening is cast the perfect likeness of the great mountain.



Crevasse on Mount Baker

Five miles to the northwest is the Baker Hot Spring, sulphurous flow boiling from the subterranean depths of the distant crater, at a temperature of 112° F. The spring is hidden beneath the shadow of great trees and



Looking into the crater of Mount Baker

has been improved by the construction of an open swimming pool.

There are at present no commercial organizations handling the tourist business to Mount Baker. Pack horses are available to make any of the trips above mentioned, but persons contemplating them would do well to make inquiries in advance.

Only experienced mountaineers should attempt to reach the summit of Mount Baker without a guide. The climb from Mazama Park is not a hard one, and mixed parties of 25 or 30 have made the ascent. Guides can be secured at Deming, Glacier, or Concrete, and would-be



Table Mountain, at the gateway of the Chain Lakes region, is a striking formation

climbers should plan to spend a week in the vicinity of the mountain to allow for possible cloudy days.

The Upper Skagit Country

The Upper Skagit River country offers attractions of a different type. Here is a paradise for the angler, the main river and its tributaries abounding in Dolly Varden, rainbow, and cutthroat trout, which may be taken in season.

Ruby Creek and its headwaters near the summit of the Cascades is a mineralized district, a storied land of early placer discoveries, lost mines, and mythical veins. It contains the ruins of many abandoned camps, water-

A Mountain Vacation Land

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Mount Baker Hot Spring, at an erratic depths of 112° F. The forest of great trees and

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Ruby Creek and its headwaters near the summit of the Cascades is a mineralized district, a storied land of early placer discoveries, lost mines, and mythical veins. It contains the ruins of many abandoned camps, water-



works, and stamp mills, while the mountain side is pierced by frequent tunnels. Future transportation may bring to this district another season of prosperity.

The mountain meadows along the summit of the Cascade Range present a broad expanse of rolling grass-land dotted with timber clumps, easily traveled on horse-back, and a charming spot in which to spend a fall vacation. It is a rich grazing ground for several bands of sheep which graze under Forest Service regulation, coming in from the east side of the mountains.



The foaming waters race through the chasm below

The Upper Skagit River country is reached over the county road coming up the Skagit Valley from Sedro-Woolley, and an automobile can proceed to a point 10 miles above Marblemount; or visitors may come on the Rockport Branch of the Great Northern Railroad to Rockport, where there is a hotel, and from which a stage line runs to the end of the road. Pack horses can be obtained at Marblemount, where there are two hotels.

There are road houses farther up the river at the mouths of Bacon, Goodell, Stetattle and Ruby Creeks, where meals and lodging can be obtained.

From the end of the wagon road to the mouth of Ruby Creek tourists must traverse the "Goat Trail," so named after the manner in which it skirts the face of the cliffs high up on the mountain side, with the foaming waters racing through the chasm below. At the Devils Elbow a notch has been blasted out of the solid face of the rock.

Just below of less than high, through the water sur a great rock pool.

The best fi found in th river, Big Creek belo falls, Ligh Creek, Devils disciple of Iz the legal limi

The valley Ruby Creek, places along t is well worth of the valley peaks which

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Lakes

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Just below Ruby Creek the canyon narrows to a width of less than 10 feet, with overhanging walls 150 feet high, through which the water surges into a great rock-walled pool.

The best fishing is found in the main river, Big Beaver Creek below the falls, Lightning

Creek, Devils Creek, and Ruby Creek, and he is a poor disciple of Izaak Walton indeed who can not bring home the legal limit.

The valley of the Skagit is comparatively wide above Ruby Creek, and there are many delightful camping places along the river. A trip to Jack Mountain Meadows is well worth while, for it commands a magnificent view of the valley and the barrier of rocky and snow-capped peaks which hem it in.

All the main watersheds are traversed by trails with signboards to indicate the distance traveled and intersecting points of interest. Substantial bridges have been thrown across the larger streams. At intervals along the main trails camping shelters have been built

to accommodate from 6 to 12 people, equipped with fireplaces, tables, and with running water nearby.

Nestling in the folds of the mountains at high elevations

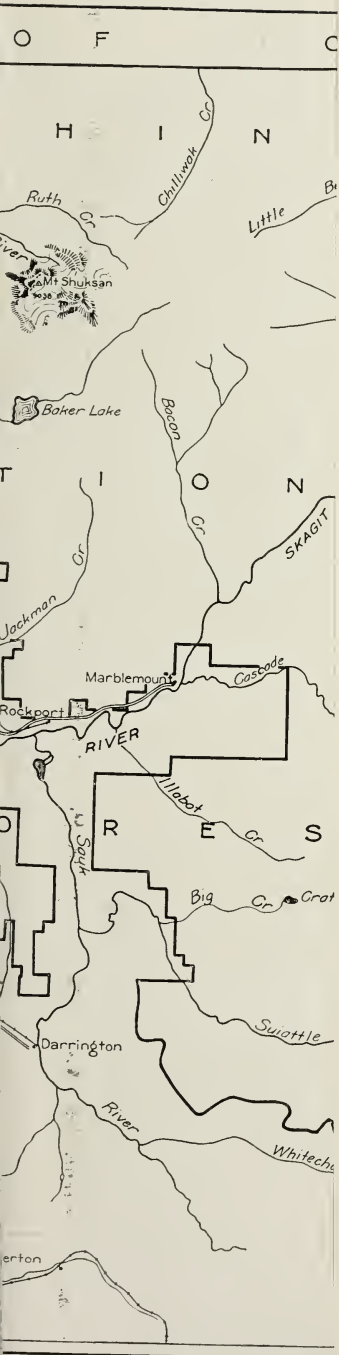


Lakes, ringed with alpine firs

are many tiny lakes fringed with alpine firs. Twin Lakes, lying in Twin Lakes Pass, 7 miles from Shuksan by trail, surrounded by grassy meadows and



Thunder Creek suspension bridge



commanding a wonderful view of the country, have most delightful camping shores.



Typical mountain goat country. This "stairway" has been highway over the mountain. The path worn by the goats is fr

Wild Life

The Washington Forest abounds in wild life. The larger animals are the cougar, wild black-tailed deer, black bear, and mountain



Ruffed grouse

streams are found Dolly Varden or bull trout, rainbow trout, and in the smaller a variety of the rainbow known as the

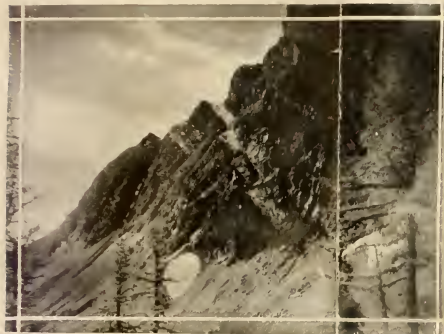
life is the grouse grouse ptarm osprey and b chief n mals marte and

The Washington National Forest covers one million four hundred and ninety thousand acres lying on the west slope of the Cascade Mountains overlooking Puget Sound directly south of the international boundary in northwestern Washington.



The freedom of the mountains and the wilderness, good hunting and fishing, and pleasant camping places make the Washington National Forest ideal country for a vacation. Go where you like and stay as long as you please. Be careful with fire.

commanding a wonderful view of the surrounding country, have most delightful camping places on the shores.



Typical mountain goat country. This "stairway" has been used for centuries as a highway over the mountain. The path worn by the goats is from 10 to 12 feet wide.

Wild Life

The Washington Forest abounds in wild life. Among the larger animals are the cougar, wildcat, marmot, black-tailed deer, black bear, and mountain goat.

Bird life is represented by the sooty or blue grouse, Oregon ruffed grouse, white-tailed ptarmigan, American osprey, golden eagle, and bald eagle. The chief fur-bearing animals are beaver, marten, lynx, fisher, and otter.

In the streams are found Dolly Varden or bull trout, cutthroat trout, rainbow trout, and in the smaller clear streams a variety of the rainbow known as the black-spotted

trout. In addition to these native fish, Lake Chelan trout have been planted in some of the smaller lakes.

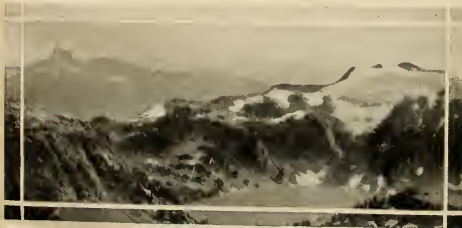
That portion of Whatcom County inside the Washington Forest has been set aside as a game preserve in which the hunting of game animals, i. e., bear, deer, and mountain goat, is prohibited for a period of five years, ending September 1, 1924. However, the State game laws do not prohibit hunting with a camera.

Shorter Fishing Trips

The Washington Forest offers many opportunities for short fishing trips. The South

Fork of the Nooksack is a particularly favored spot for a 5-day outing. This trip should be made by way of Deming.

The mouth of Illabot Creek is reached by automobile, after crossing the Skagit River at Rockport, and there is fine sport here, as well as in Illabot Lake 10 miles upstream.



A typical mountain lake

There is fairly good fishing in Finney Creek, which may be reached from Sauk over a 5-mile trail.



Mountain goat



Ruffed grouse

A Mountain Recreation Land

the surrounding trout. In addition to these native fish, Lake Chelan places on their trout have been planted in some of the smaller lakes.

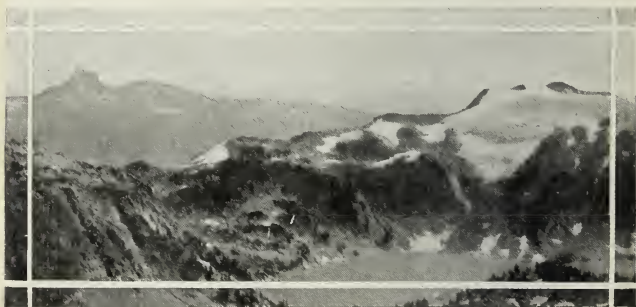
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used for centuries from 10 to 12 feet wide

and life. Among the cat, marmot, mountain goat. Bird life is represented by the sooty or blue, Oregon ruffed, white-tailed, goshawk, American, golden eagle, bald eagle. The fur-bearing animals are beaver, marten, lynx, fisher, mink. In the trout, cutthroat, rainbow, and clear stream black-spotted



Mountain goat

Fishing within the main Skagit River below Goodell Creek is not good.

Dolly Varden and rainbow trout are found in Baker Lake, but on the west



Camping party in the Upper Skagit River

his watershed, owing to glacial water. A strong attraction to the angler.

The Suiattle River and its tributaries are very little fished owing to the difficulty of crossing the Sauk River. The Forest Ranger has a rowboat here, and frequently arranges crossings with forest officers for a crossing.



Park Creek Pass—a mighty notch, with Storm King Mountain on either side

Fishing in the North Fork of the Skagit River and its tributaries east of Glacier is not so good. The streams here are being stocked and will be better in a few years.

Keep the Forest

The Washington National Forest Service has a portion of the Skagit River reservoir. It holds a portion of the water which, because of remoteness, has not been fished yet. At present its recreational value is of the greatest interest to the average citizen. He may come and enjoy that resource to the full at the same time he is cautioned to be careful. There has been no devastating blazes in the forest. Each year sees the forest greener than the year before. A small part of this favorable condition is due to the cooperation of the public. Such cooperation is appreciated. Forest field officers will gladly give all assistance compatible with the law. They have duties, and they hope that visitors will lighten the burden of those duties as much as possible. In the fire season by thoughtfulness in the use of matches which go to prevent the escape of fire, the help for the camper is:

LEAVE A DEAD FIRE AND

Fishing within the main Skagit River and its tributaries below Goodell Creek is not good.

Dolly Varden and rainbow trout and whitefish are found in Baker Lake, but on the whole the streams in



Camping party in the Upper Skagit River country

this watershed, owing to glacial water, do not offer a strong attraction to the angler.

The Suiattle River and its tributaries are splendid streams very little fished owing to the difficulty of getting across the Sauk River. The Forest Service has a rowboat here, and frequently arrangements can be made with forest officers for a crossing.



Park Creek Pass—a mighty notch, with Storm King and Logan Peak towering on either side

Fishing in the North Fork of the Nooksack and its tributaries east of Glacier is not so good. However, the streams here are being stocked and will be right in a few years.

The Mountain Portals

Along the summit of the Cascades are many picturesque mountain passes, the gateways into western Washington.

By far the most striking is Park Creek Pass, at the head of Thunder Creek, resembling a great notch cut by the hand of a giant, with Storm King and Logan Peak towering aloft on either side.

The Lake Chelan country may also be reached by way of Cascade Pass, which is the most direct route. Persons desiring to make this trip can secure provisions at Rockport and comfortably make the journey on foot from Marblemount to Lake Chelan in four days. Lost Lake basin just beyond Cascade Pass is a formation of fascinating beauty.

The longest intermountain journey through the Washington Forest, however, is by way of Slate Creek Pass at the head of Ruby Creek, which leads into the Okanogan Valley country. Here the tourist is well repaid for his time and energy, as the route passes through the Skagit River canyon and through a mountain meadow country of unsurpassing beauty.

The trails leading to all these passes are in first-class condition, but they are usually free from snow on the summit only between July 1 and October 31. Late seasons are frequent, however, and tourists will do well to secure definite information from the forest supervisor before undertaking an intermountain trip early in July or late in October.



Mirror Lake

Keep the Forest Green

The Washington National Forest is essentially a timber reservoir. It holds a portion of the future supply which, because of remoteness, has been little logged as yet. At present its recreational resource is perhaps of greatest interest to the average citizen, who is invited to come and enjoy that resource to the utmost. At the same time he is cautioned to be careful always with fire. There has been no devastating blaze for a long time. Each year sees the forest greener than it was before. No small part of this favorable condition is due to the cooperation of the public. Such cooperation is appreciated. Forest field officers will gladly render tourists all assistance compatible with the performance of their duties, and they hope that visitors will in turn lighten the burden of those duties as much as possible during the fire season by thoughtfulness in the many little things which go to prevent the escape of fire. A good motto for the camper is:

LEAVE A DEAD FIRE AND A CLEAN CAMP



*"The woods were God's first temples." Tiny crosses
tip the points of spired alpine firs*

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Green

is essentially a thing of the future supply. It has been little logged as a source is perhaps exhausted, who is invited to the utmost. At the same time it is always with fire for a long time as it was before. No doubt is due to the operation is apparently render tourists performance of their will in turn lighter as possible during the many little things fire. A good motto



"The woods were God's first temples." Tiny crosses tip the points of spired alpine firs

A CLEAN CAMP

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UNITED STATES GRADES FOR MILLED RICE

RECOMMENDED BY THE UNITED STATES DEPARTMENT
OF AGRICULTURE



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR NO. 133

Contribution from the Bureau of Markets
GEORGE LIVINGSTON, Chief

GRAIN DIVISION
H. J. Besley, In Charge
E. G. Boerner, In Charge, Grain Investigations
W. D. Smith, Grain Supervisor, Rice Project

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UNITED STATES GRADES FOR MILLED RICE.

Recommended by the United States Department of Agriculture.¹

The following grades for the grading and marketing of milled rice are recommended by the Bureau of Markets of the United States Department of Agriculture.

In September, 1918, permissive standards for milled rice were published by the Department of Agriculture (Markets Document 15) and adopted by the United States Food Administration and by boards of trade and other agencies engaged in the handling of milled rice. Certain changes were made in these permissive standards as the result of the department's observation and experience with them, and the revised grades were published in tentative form as the basis of proposed standards to be established under the United States grain standards Act as the official grain standards of the United States for milled rice. Hearings were held at convenient points to the principal rice producing and distributing sections, at which the comments and criticisms of rice producers, millers, merchants, warehousemen, carriers, and others interested were received. All criticisms and suggestions at the hearings and through written communications have had careful consideration.

The grades here recommended are the result of extensive investigations relating to the various phases of the rice industry conducted by the Department of Agriculture, of the observations and experience of the department with the permissive standards published in September, 1918, and the suggestions received by the department at the hearings referred to above.

The classification in the standards is based on the length of whole kernels for classes I, II, III, and IV, and on size of broken kernels for classes V, VI, and VII. For the purposes of a general classification the Bureau of Plant Industry, United States Department of Agriculture, has heretofore referred to the different varieties as long-grain, medium-grain, and short-grain, and has used these terms in its publications dealing with rice culture and production. At the hearings mentioned above, the trade objected to the class name Medium as applied to the translucent type of the variety known commercially as Early Prolific and the varieties known commercially as Blue Rose and Louisiana Pearl, and to the class name Medium-opaque as applied to the opaque type of the variety known commercially as Early Prolific, for the reason that the word "medium" is

¹ These standards embody the recommendations of the United States Department of Agriculture, but are not fixed and established at this time under the United States grain standards Act because of a lack of funds for their proper enforcement as compulsory standards.

now used in commercial terminology as a grade name and denotes an inferior grade of rice. It was suggested by the trade that the class name Short be used to apply to the varieties known commercially as Blue Rose, Louisiana Pearl, and Early Prolific, and that the class name Round be used to apply to the varieties known commercially as Japan or Japanese, and it is felt that they more nearly conform to commercial needs and should be adopted.

These grades are not fixed and established under the United States grain standards Act at this time, but it is hoped that they will be adopted by all agencies engaged in the handling of milled rice. It is believed that with the voluntary and general support of all interested parties these standards will assist very materially in the marketing of milled rice.

UNITED STATES GRADES FOR MILLED RICE.

For the purposes of the United States grades for milled rice:

SECTION 1. *Milled rice*.—Milled rice shall be whole or broken kernels of rice grown in continental United States, from which the hulls, germs, and practically all of the bran layers have been removed, which may be either coated or uncoated, and which shall contain not more than ten per centum of seeds, paddy grains, other cereal grains, and other foreign material, either singly or in any combination.

SECTION 2. *Basis of determinations*.—Each determination of paddy grains, other cereal grains, seeds, other foreign material, heat-damaged kernels, temperature, odor, live weevils or other insects injurious to stored rice, color, coating, and moisture shall be made on the basis of the grain including foreign material. All other determinations shall be made on the basis of the grain when free from foreign material.

SECTION 3. *Percentages*.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

SECTION 4. *Percentage of moisture*.—Percentage of moisture shall be that ascertained by the moisture tester and the method of use thereof described in Circular No. 72, and supplement thereto, issued by the United States Department of Agriculture, Bureau of Plant Industry, except that the flask to be used shall be the double-walled flask described in the United States Department of Agriculture Bulletin No. 56, or that ascertained by any device and method giving equivalent results.

SECTION 5. (a) *No. 5½ sieve*.—A metal sieve perforated with round holes 5½ sixty-fourths inch in diameter.

(b) *No. 6 sieve*.—A metal sieve perforated with round holes 6 sixty-fourths inch in diameter.

(c) *No. 6½ sieve*.—A metal sieve perforated with round holes 6½ sixty-fourths inch in diameter.

SECTION 6. *Coated rice*.—Coated rice shall be rice which has been coated with glucose and talc or any other substance. Coated rice shall be graded and designated according to the grade requirements of the standards applicable to such rice if it were not coated, and there shall be added to and made a part of such grade designation the word "coated."

SECTION 7. *Damaged kernels.*—Damaged kernels shall be kernels and pieces of kernels of milled rice which have been distinctly damaged by water, insects, or by any other means. Sound double and sound broken kernels shall not be considered damaged kernels.

SECTION 8. *Heat-damaged kernels.*—Heat-damaged kernels shall be kernels and pieces of kernels of milled rice which have been distinctly discolored by external heat or as a result of heating caused by fermentation.

SECTION 9. *Foreign material.*—Foreign material shall be paddy grains and any matter other than rice.

SECTION 10. *Cereal grains.*—Cereal grains shall be paddy grains (rough rice), rye, barley, emmer, spelt, einkorn, corn, grain sorghums, oats, and wheat only, and shall not include buckwheat, flaxseed, and wild oats.

SECTION 11. *Paddy grains.*—Paddy grains shall be grains of rice from which the hulls have not been removed.

SECTION 12. *Seeds.*—Seeds shall be grains, kernels, or seeds, either whole or broken, of any plant other than rice or other cereal grains.

SECTION 13. *Red rice.*—Red rice shall be kernels or pieces of kernels of milled rice which are distinctly red in color or have any red bran thereon.

SECTION 14. *Whole kernels.*—Whole kernels shall include perfect kernels of milled rice and pieces of kernels of milled rice which are not split and which in length are equal to or greater than three-fourths of the length of the perfect kernel.

SECTION 15. *Broken kernels.*—Broken kernels shall be split kernels of milled rice, and pieces of kernels which are less than three-fourths of the length of the perfect kernel.

SECTION 16. *Chalky kernels.*—Chalky kernels shall be kernels and pieces of kernels of milled rice, one-half or more of which is chalky.

CLASSES OF MILLED RICE.

SECTION 17. Milled rice shall be divided into classes as follows:

Class I. Long.

This class shall include all long-grain rices, such as those known commercially as Honduras, Carolina Gold, Carolina White, and Edith, which contain more than twenty-five per centum of whole kernels and not more than four per centum of whole kernels of rice of the classes Short and Round, either singly or combined.

Class II. Short.

This class shall include all short-grain rices, such as those known commercially as Blue Rose, Louisiana Pearl, and Early Prolific, which contain more than twenty-five per centum of whole kernels and not more than four per centum of whole kernels of the classes Long and Round, either singly or combined.

Class III. Round.

This class shall include all round-grain rices, such as those known commercially as Japan or Japanese, including Wataribune, Shinriki, "1564" (Butte),¹ "1600" (Colusa),¹ and Onsen, which contain more than twenty-five per centum of whole kernels and not more than four per centum of whole kernels of rice of the classes Long and Short, either singly or combined.

Class IV. Mixed.

This class shall be a mixture of any two or more of classes I, II, and III, but which does not meet the requirements of any one of such classes.

Class V. Second Head.

This class shall consist of milled rice which contains not more than twenty-five per centum of whole kernels, not more than forty per centum of broken kernels which will pass readily through a No. 6½ sieve, and not more than ten per centum of broken kernels which will pass readily through a No. 6 sieve.

Class VI. Screenings.

This class shall consist of milled rice which contains not more than twenty-five per centum of whole kernels, which does not meet the requirements of size separations specified for the class Second Head, and which contains not more than fifteen per centum of broken kernels which will pass readily through a No. 5½ sieve.

Class VII. Brewers.

This class shall consist of milled rice which contains not more than twenty-five per centum of whole kernels and contains more than fifteen per centum of broken kernels which will pass readily through a No. 5½ sieve.

GRADE REQUIREMENTS.**Long Milled Rice.**

SECTION 18. *Grades for Long Milled Rice.*—The class Long shall be divided into five grades, the designations and requirements of which shall be as specified in this section.

Extra Fancy (U. S. No. 1) Long

- (a) shall be well milled,
- (b) shall be white or creamy,
- (c) may contain not more than five-tenths of one per centum of chalky kernels,
- (d) shall contain ninety per centum or more of whole kernels, but may contain not more than five-tenths of one per centum of broken kernels which will pass readily through a No. 6 sieve,

¹ The varieties C. I. 1564 and C. I. 1600 were named Butte and Colusa, respectively, by the Office of Cereal Investigations, Bureau of Plant Industry, United States Department of Agriculture, May, 1920.

- (e) may contain a total of not more than three paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of three may include not more than either one heat-damaged kernel or one seed,
- (f) may contain not more than five-tenths of one per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than one per centum of whole kernels of rice of the classes Short and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Fancy (U. S. No. 2) Long

- (a) shall be well milled,
- (b) shall be white, creamy, or grayish,
- (c) may contain not more than one and five-tenths per centum of chalky kernels,
- (d) shall contain eighty-five per centum or more of whole kernels, but may contain not more than one per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than eight paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eight may include not more than four heat-damaged kernels and seeds, either singly or combined,
- (f) may contain not more than one and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than two per centum of whole kernels of rice of the classes Short and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 3) Long

- (a) shall be reasonably well milled,
- (b) shall be white, creamy, or grayish, and may be slightly rosy,
- (c) may contain not more than three per centum of chalky kernels,
- (d) shall contain seventy-five per centum or more of whole kernels, but may contain not more than one and five-tenths per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than eighteen paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eighteen may include not more than ten heat-damaged kernels and seeds, either singly or combined,

- (f) may contain not more than two and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than four per centum of whole kernels of rice of the classes Short and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Medium (U. S. No. 4) Long

- (a) may be any color except of badly damaged or extremely red,
- (b) may contain not more than six per centum of chalky kernels,
- (c) shall contain sixty-five per centum or more of whole kernels, but may contain not more than three per centum of broken kernels which will pass readily through a No. 6 sieve,
- (d) may contain a total of not more than forty paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of forty may include not more than twenty-four heat-damaged kernels and seeds, either singly or combined,
- (e) may contain not more than five per centum of damaged kernels and red rice, either singly or combined,
- (f) may contain not more than four per centum of whole kernels of rice of the classes Short and Round, either singly or combined,
- (g) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (h) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Long

shall be milled rice of the class Long which does not come within the requirements of any of the grades from Extra Fancy (U. S. No. 1) to Medium (U. S. No. 4), inclusive, or which has any commercially objectionable foreign odor, or is musty, or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

Short Milled Rice.

SECTION 19. *Grades for Short Milled Rice.*—The class Short shall be divided into five grades, the designations and requirements of which shall be specified in this section.

Extra Fancy (U. S. No. 1) Short

- (a) shall be well milled,
- (b) shall be white or creamy,
- (c) may contain not more than five-tenths of one per centum of chalky kernels,

- (d) shall contain ninety-five per centum or more of whole kernels, but may contain not more than five-tenths of one per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than three paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of three may include not more than either one heat-damaged kernel or one seed,
- (f) may contain not more than five-tenths of one per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than one per centum of whole kernels of rice of the classes Long and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Fancy (U. S. No. 2) Short

- (a) shall be well milled,
- (b) shall be white, creamy, or grayish,
- (c) may contain not more than one and five-tenths per centum of chalky kernels,
- (d) shall contain ninety per centum or more of whole kernels, but may contain not more than one per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than eight paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eight may include not more than four heat-damaged kernels and seeds, either singly or combined,
- (f) may contain not more than one and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than two per centum of whole kernels of rice of the classes Long and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 3) Short

- (a) shall be reasonably well milled,
- (b) shall be white, creamy, or grayish, and may be slightly rosy,
- (c) may contain not more than three per centum of chalky kernels,
- (d) shall contain eighty per centum or more of whole kernels, but may contain not more than one and five-tenths per centum of broken kernels which will pass readily through a No. 6 sieve,

- (e) may contain a total of not more than eighteen paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eighteen may include not more than ten heat-damaged kernels and seeds, either singly or combined,
- (f) may contain not more than two and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than four per centum of whole kernels of rice of the classes Long and Round, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Medium (U. S. No. 4) Short

- (a) may be any other color except of badly damaged or extremely red,
- (b) may contain not more than six per centum of chalky kernels,
- (c) shall contain seventy per centum or more of whole kernels, but may contain not more than three per centum of broken kernels which will pass readily through a No. 6 sieve,
- (d) may contain a total of not more than forty paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of forty may include not more than twenty-four heat-damaged kernels and seeds, either singly or combined,
- (e) may contain not more than five per centum of damaged kernels and red rice, either singly or combined,
- (f) may contain not more than four per centum of whole kernels of rice of the classes Long and Round, either singly or combined,
- (g) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (h) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Short

shall be milled rice of the class Short which does not come within the requirements of any of the grades from Extra Fancy (U. S. No. 1) to Medium (U. S. No. 4), inclusive, or which has any commercially objectionable foreign odor, or is musty, or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

Round Milled Rice.

SECTION 20. *Grades for Round Milled Rice.*—The class Round shall be divided into five grades, the designations and requirements of which shall be as specified in this section.

Extra Fancy (U. S. No. 1) Round

- (a) shall be well milled,
- (b) shall be white or creamy,
- (c) may contain not more than one per centum of chalky kernels,
- (d) shall contain ninety-five per centum or more of whole kernels, but may contain not more than five-tenths of one per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than three paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of three may include not more than either one heat-damaged kernel or one seed,
- (f) may contain not more than five-tenths of one per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than one per centum of whole kernels of rice of the classes Long and Short, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Fancy (U. S. No. 2) Round

- (a) shall be well milled,
- (b) shall be white, creamy, or grayish,
- (c) may contain not more than three per centum of chalky kernels,
- (d) shall contain ninety per centum or more of whole kernels, but may contain not more than one per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than eight paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eight may include not more than four heat-damaged kernels and seeds, either singly or combined,
- (f) may contain not more than one and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than two per centum of whole kernels of rice of the classes Long and Short, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 3) Round

- (a) shall be reasonably well milled,
- (b) shall be white, creamy, or grayish, and may be slightly rosy,

- (c) may contain not more than six per centum of chalky kernels,
- (d) shall contain eighty per centum or more of whole kernels, but may contain not more than one and five-tenths per centum of broken kernels which will pass readily through a No. 6 sieve,
- (e) may contain a total of not more than eighteen paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of eighteen may include not more than ten heat-damaged kernels and seeds, either singly or combined,
- (f) may contain not more than two and five-tenths per centum of damaged kernels and red rice, either singly or combined,
- (g) may contain not more than four per centum of whole kernels of rice of the classes Long and Short, either singly or combined,
- (h) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (i) may contain not more than fourteen and one-half per centum of moisture.

Medium (U. S. No. 4) Round

- (a) may be any color except of badly damaged or extremely red,
- (b) may contain not more than ten per centum of chalky kernels,
- (c) shall contain seventy per centum or more of whole kernels, but may contain not more than three per centum of broken kernels which will pass readily through a No. 6 sieve,
- (d) may contain a total of not more than forty paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of forty may include not more than twenty-four heat-damaged kernels and seeds, either singly or combined,
- (e) may contain not more than five per centum of damaged kernels and red rice, either singly or combined,
- (f) may contain not more than four per centum of whole kernels of rice of the classes Long and Short, either singly or combined,
- (g) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (h) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Round

shall be milled rice of the class Round which does not come within the requirements of any of the grades from Extra Fancy (U. S. No. 1) to Medium (U. S. No. 4), inclusive, or which has any commercially objectionable foreign odor, or is musty, or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

Mixed Milled Rice.

SECTION 21. *Grades for Mixed Milled Rice.*—Mixed milled rice shall be graded according to the grade requirements of the class of milled rice which predominates over each other class in the mixture; the grade designations of such rice shall include successively in the order named, the name of the grade or the number thereof, the word "Mixed," and, in the order of its predominance, the name and approximate percentage of the whole kernels of each class of rice in the mixture.

Second Head Milled Rice.

SECTION 22. *Grades for Second Head Milled Rice.*—The class Second Head shall be divided into three grades, the designations and requirements of which shall be as specified in this section.

Fancy (U. S. No. 1) Second Head

- (a) shall be white, creamy, or grayish,
- (b) may contain not more than five per centum of chalky kernels,
- (c) may contain not more than twenty-five per centum of broken kernels which will pass readily through a No. 6½ sieve, or not more than five per centum of broken kernels which will pass readily through a No. 6 sieve,
- (d) May contain a total of not more than twenty paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of twenty may include not more than sixteen heat-damaged kernels and seeds, either singly or combined,
- (e) may contain not more than two per centum of damaged kernels and red rice, either singly or combined,
- (f) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (g) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 2) Second Head

- (a) may be any color except of badly damaged or extremely red,
- (b) may contain not more than ten per centum of chalky kernels,
- (c) may contain a total of not more than fifty paddy grains, other cereal grains, seeds, and heat-damaged kernels in five hundred grams, which total of fifty may include not more than forty heat-damaged kernels and seeds, either singly or combined,
- (d) may contain not more than six per centum of damaged kernels and red rice, either singly or combined,
- (e) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (f) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Second Head

shall be milled rice of the class Second Head which does not come within the requirements of grades Fancy (U. S. No. 1) and Choice (U. S. No. 2), or which has any commercially objectionable foreign odor, or is musty, or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

Screenings Milled Rice.

SECTION 23. *Grades for Screenings Milled Rice.*—The class Screenings shall be divided into three grades, the designations and requirements of which shall be as specified in this section.

Fancy (U. S. No. 1) Screenings

- (a) shall be white, creamy, or grayish,
- (b) may contain not more than ten per centum of chalky kernels,
- (c) may contain not more than twenty-five per centum of broken kernels which will pass readily through a No. 6 sieve, and not more than ten per centum of broken kernels which will pass readily through a No. 5½ sieve,
- (d) may contain a total of not more than thirty paddy grains, other cereal grains, and seeds in five hundred grams, which total of thirty may include not more than twenty seeds,
- (e) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (f) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 2) Screenings

- (a) may be any color except of badly damaged or extremely red,
- (b) may contain not more than fifteen per centum of chalky kernels,
- (c) may contain not more than fifty per centum of broken kernels which will pass readily through a No. 6 sieve, and not more than fifteen per centum of broken kernels which will pass readily through a No. 5½ sieve,
- (d) may contain a total of not more than seventy paddy grains, other cereal grains, and seeds in five hundred grams, which total of seventy may include not more than sixty seeds,
- (e) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (f) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Screenings

shall be milled rice of the class Screenings which does not come within the requirements of grades Fancy (U. S. No. 1) and Choice (U. S. No. 2), or which has any commercially objectionable foreign odor, or is musty, or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

Brewers Milled Rice.

SECTION 24. *Grades for Brewers Milled Rice.*—The class Brewers shall be divided into three grades, the designations and requirements of which shall be as specified in this section.

Fancy (U. S. No. 1) Brewers

- (a) shall be white, creamy, or grayish,
- (b) may contain a total of not more than fifty paddy grains, other cereal grains, and seeds in five hundred grams, which total of fifty may include not more than forty seeds,
- (c) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (d) may contain not more than fourteen and one-half per centum of moisture.

Choice (U. S. No. 2) Brewers

- (a) may be any color except of badly damaged or extremely red,
- (b) may contain a total of not more than eighty paddy grains, other cereal grains, and seeds in five hundred grams, which total of eighty may include not more than seventy seeds,
- (c) may contain not more than one-tenth of one per centum of foreign material excepting paddy grains, other cereal grains, and seeds, and
- (d) may contain not more than fourteen and one-half per centum of moisture.

Sample Grade Brewers

shall be milled rice of the class Brewers which does not come within the requirements of either of the grades Fancy (U. S. No. 1) or Choice (U. S. No. 2), or which has any commercially objectionable foreign odor, or is musty or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality.

FOOD AND DRUGS ACT.

Nothing herein shall be construed as authorizing the adulteration of milled rice by the addition of water, by the admixture of hulls or straw, decomposed or damaged kernels of rice, other grains, or any other foreign material, or otherwise, in violation of the Food and Drugs Act of June 30, 1906, nor as authorizing the coating of rice or the labeling thereof in violation of that act.

APPENDIX.

Class.	Grade.	Red rice and damaged other than heat.		Number in 500 grams.		Size separations.					Chalky.	Other rices.	Color.		
			P. ct.	Cereal grains, seeds, heat-damaged kernels.		Whole kernels.	Broken kernels through sieves—								
				Total.	H. D. and seeds (singly or combined).		P. ct.	No.	P. ct.	No. 5½.				No. 6.	No. 6½.
Long	Extra Fancy (U. S. No. 1)¹	0.5	3	No.	90	P. ct.	0.5	P. ct.	0.5	P. ct.	1	White or creamy.			
	Fancy (U. S. No. 2)¹	1.5	8	4	85	1.0	1.0	1.5	1.5	2	White, creamy, or grayish.				
	Choice (U. S. No. 3)¹	2.5	18	10	75	1.5	1.5	3.0	3.0	4	White, creamy, or grayish, and may be slightly rosy.				
	Medium (U. S. No. 4)	5.0	40	24	65	3.0	3.0	6.0	6.0	4	Any color except of badly damaged or extremely red.				
	Sample grade²									1	White or creamy.				
Short	Extra Fancy (U. S. No. 1)¹	0.5	3	1	95	0.5	0.5	0.5	0.5	1	White or creamy.				
	Fancy (U. S. No. 2)¹	1.5	8	4	90	1.0	1.0	1.5	1.5	2	White, creamy, or grayish.				
	Choice (U. S. No. 3)¹	2.5	18	10	80	1.5	1.5	3.0	3.0	4	White, creamy, or grayish, and may be slightly rosy.				
	Medium (U. S. No. 4)	5.0	40	24	70	3.0	3.0	6.0	6.0	4	Any color except of badly damaged or extremely red.				
	Sample grade²									4	White or creamy.				
Round	Extra Fancy (U. S. No. 1)¹	0.5	3	1	95	0.5	0.5	0.5	1.0	1	White or creamy.				
	Fancy (U. S. No. 2)¹	1.5	8	4	90	1.0	1.0	1.5	3.0	2	White, creamy, or grayish.				
	Choice (U. S. No. 3)¹	2.5	18	10	80	1.5	1.5	3.0	6.0	4	White, creamy, or grayish, and may be slightly rosy.				
	Medium (U. S. No. 4)	5.0	40	24	70	3.0	3.0	6.0	10.0	4	Any color except of badly damaged or extremely red.				
	Sample grade²									4	White or creamy.				
Mixed	(See footnote 3).											White, creamy, or grayish.			
	Fancy (U. S. No. 1).	2.0	20	16		5.0	5.0	25.0	5.0			White, creamy, or grayish.			
Second head	Choice (U. S. No. 2).	6.0	50	40		10.0	10.0	40.0	10.0			Any color except of badly damaged or extremely red.			
	Sample grade²											White, creamy, or grayish.			
Screenings	Fancy (U. S. No. 1).		30	20		25.0	25.0	10.0	10.0			Any color except of badly damaged or extremely red.			
	Choice (U. S. No. 2).		70	60		50.0	50.0	15.0	15.0			Any color except of badly damaged or extremely red.			
Brewers	Sample grade²											White, creamy, or grayish.			
	Fancy (U. S. No. 1).		50	40								Any color except of badly damaged or extremely red.			
	Choice (U. S. No. 2).		80	70								Any color except of badly damaged or extremely red.			

¹ Rice of the grades Extra Fancy (U. S. No. 1) and Fancy (U. S. No. 2) in classes I, II, III, and IV shall be well milled. Rice of the grade Choice (U. S. No. 3) in classes I, II, III, and IV shall be reasonably well milled.

² Shall be milled rice which does not come within the requirements of any of the other grades of the class to which it belongs or which has any commercially objectionable foreign odor, or is musty or sour, or is heating, hot, infested with weevils or other insects injurious to stored rice, or is otherwise of distinctly low quality, or contains more than one-tenth of one per centum of foreign material excepting cereal grains and seeds, or contains more than fourteen and one-half per centum of moisture.

³ Mixed milled rice shall be graded according to the grade requirements of the class of milled rice which predominates over each other class in the mixture; the grade designations of such rice shall include, successively in the order named, the name of the grade, or the number thereof, the word "Mixed," and, in the order of its predominance, the name and approximate percentage of the whole kernels of each class of rice in the mixture.

NOTE.—The figures in the above tabulation in all cases, except whole kernels, indicate maximum limit; the figures under whole kernels indicate minimum limit. The above is merely an abridged tabulation. For the definitions and requirements of the classes of milled rice, see section 17.

LIVE-STOCK GRAZING AS A FACTOR
IN FIRE PROTECTION ON THE
NATIONAL FORESTS

JOHN H. HATTON

Assistant District Forester



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 134

Contribution from the Forest Service
WILLIAM B. GREELEY, Forester

Washington, D. C.

September, 1920

LIVE-STOCK GRAZING AS A FACTOR IN FIRE PROTECTION ON THE NATIONAL FORESTS.

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PURPOSE.

Grazing has always been an acknowledged minor influence in fire protection. On the other hand, unregulated or uncontrolled grazing is destructive to Forest interests; and the injuries from grazing in the earlier days of unrestricted competition far outweighed the benefits. The possibility of planning grazing management so as to afford greater protection against fire calls for more constructive thought than has heretofore been given it. It must be recognized, however, that grazing may be made a benefit or a drawback in National Forest economy—that its value as a protective factor can be easily overdrawn. Great care must be taken not to destroy more than we protect. In recognizing the protective value of grazing we must not be led into condoning general injury to reproduction or other resources, which might be prevented, on the ground that the injury is more than compensated by the reduction in fire hazard. There is need, however, for constructive effort to use grazing in our National Forest fire-protection plans, especially at critical points. The tendency has been to follow the easier way of grazing a complete unit instead of concentrating on critical or strategic points.

The benefits of grazing may be summarized as follows:

- (1) Keeping fires from starting.
- (2) Keeping fires from spreading.
- (3) Rendering fires less destructive.

The drawbacks:

- (1) Injury to forest growth.
- (2) Injury to soil and water conditions.
- (3) Injury to range.

It is purposed here to call attention to some concrete examples of the beneficial results in fire protection of live-stock uses, to suggest methods for their more extensive application, and to stimulate fuller thought and closer observation on this subject. More concrete data are needed on the actual application of the protective features of grazing.

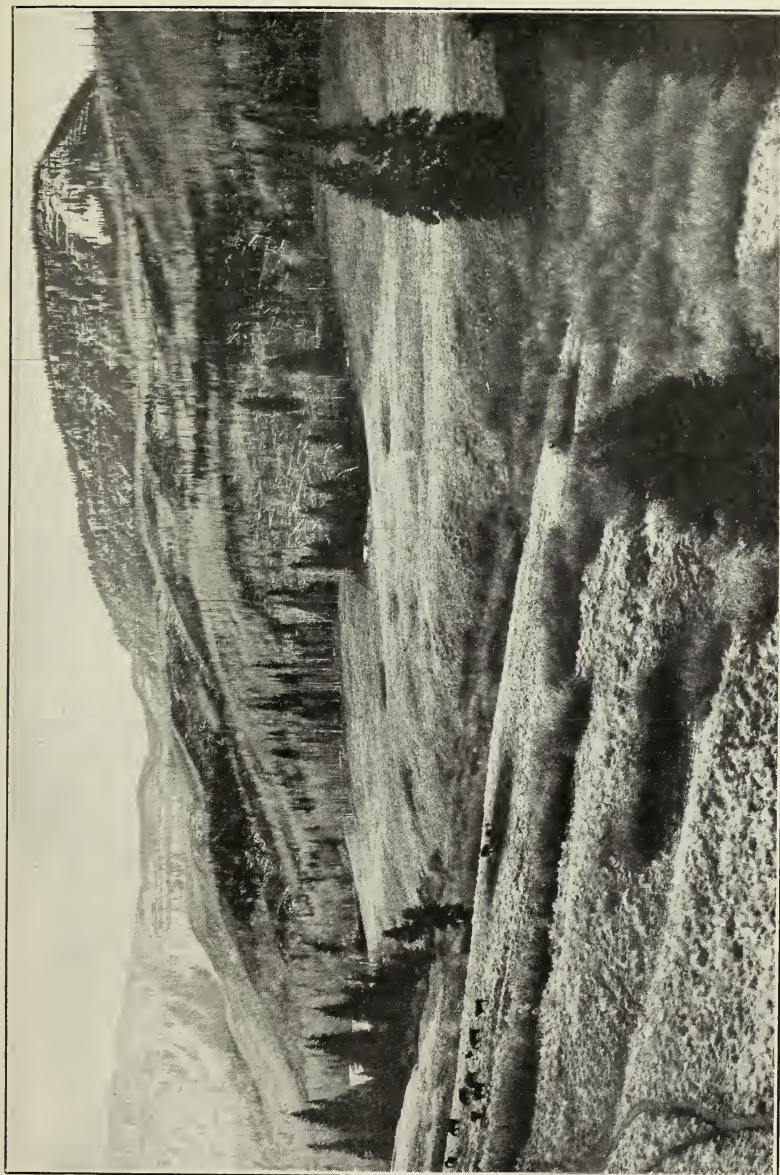
HISTORY.

In the year 1900, partly because mountain ranges were needed to support the stock industry of the West and partly because of the necessity for fuller knowledge upon which to base a definite grazing policy, the Department of the Interior called upon the Department of Agriculture to make a thorough study of the effect of grazing upon the most important Forest Reserves then existing, with a special request for reports on the relation of grazing to forest fires. Among the questions asked of the examiners were these:

- (1) Does grazing decrease or diminish the danger from fire?
- (2) Do herders or stockmen set fire to the forests to improve the range?
- (3) What is the effect of repeated burning upon the forest and upon the range?
- (4) How long a time should pass before burned range is grazed again in the forest and outside?
- (5) What is the relative effect of grazing before and after burning, on the grass, the forest, and the soil?

The investigation for the most part showed that the supposed setting of fires by stockmen to clear or improve the range had been much overdrawn; that the danger from this source and from carelessness on the part of stockmen had either disappeared or was rapidly disappearing; that burning was a harm instead of a benefit to forage conditions; and that grazing of different kinds of stock could be allowed in reasonable numbers under proper regulation without undue injury to forest and water resources. The reports also brought out very forcibly the harmful effects of uncontrolled grazing in the past.

A systematic attempt to reduce these general impressions to concrete statements, supported by specific examples, was inaugurated in the spring of 1912, and reports were received that season from 120 of the 160 Forests then existing. While some of these reports showed, for particular situations or conditions, that grazing had an indifferent influence, and a very small number showed unfavorable effects, the large majority were positive in the statement that grazing constituted an important factor in fire protection. Many concrete illustrations were furnished which strengthened the feeling, already existing, that, in the balance of beneficial and harmful effects, judicious grazing may be a certain asset in fire protection. The study also



F-43402

A PROPER GRAZING USE OF THE NATIONAL FORESTS. NOTE COW TRAILS WHICH ARE GOOD FIRE LINES.
COLORADO.

brought out the fact that different localities presented different problems and conditions, requiring different treatment, and that the same results from grazing did not necessarily follow in all places.

INFLUENCE OF GRAZING UPON THE NUMBER OF FIRES.

Of 120 Forests reporting in 1912, 81 per cent stated that the number of fires was reduced by the annual removal of the forage crop; 12.5 per cent reported to the contrary; the remainder made no statement. That fires are reduced in number by the annual removal of herbaceous growth should be axiomatic. The question is: "Does *normal grazing*—the sort of grazing that it is desired to carry out on the Forests—count as a protective influence worthy of consideration?"¹ The studies undertaken show that it does. By the removal of inflammable growth and the breaking up of dead and down litter, grazing has an appreciable influence in decreasing the number and spread of fires and in increasing the difficulties of incendiarism. Records compiled from seven National Forests representing typical conditions in as many States show that grazing causes an average reduction in the number of fires of over 60 per cent—the percentages ranging from a minimum of 50 to a maximum of 75.

On the limited number of Forests where grazing is reported to be of doubtful advantage in heavy timber, the reports are based on the scarcity or complete lack of forage and the fact that stock occupy such areas very little, if at all. The favorable effects are especially marked on areas formerly visited by destructive fires. To illustrate: An instance is given where five years of grazing on the Deerlodge Forest, Mont., resulted in breaking down and wearing out over 50 per cent of the litter on a dangerous fire-trap area. Decaying logs which rot from the interior, as in the case of lodge-pole pine, have their outer shells broken by constant trampling of sheep, which thus hastens disintegration. The effects of cattle grazing are not so marked, since the tendency of cattle is to follow trails and to step over obstacles; but any kind of grazing shows positive results, depending upon the intensity of use and the adaptability of the area to grazing. Of course, grazing can not be used under all conditions. While 75 per cent of the National Forest area is being used or is susceptible of being used for grazing, and while 96 per cent of this area is clothed with some form of inflammable material, there are still many portions of the Forests on which, through inaccessibility or absence of suitable plant growth, it is impracticable to graze stock.

¹ By normal grazing is meant grazing only to such an extent that the forage crop does not decrease from year to year.

INFLUENCE OF GRAZING ON THE INTENSITY AND AREA OF FIRES.

Strictly accurate comparisons of the effects of grazing in reducing the intensity and area of fires must take into account any possible factors influencing them, such as origin, topography, character of cover, climatic conditions, time of day, and effectiveness of the protective organization. For instance, data collected on the Forests of the Cascade Mountains, Washington and Oregon, would not apply to conditions on the Forests east of that range.

On a well-stocked Forest, such as the Fremont in Oregon, which is comparatively level, with no abrupt changes in elevation or material differences in the character of the timber or forage cover, and on which the range is equally well adapted to cattle or sheep, comparisons are easily made. The average area burned per fire on sheep allotments here is 24 acres, on cattle and horse allotments 114, and on areas where lack of stock water reduces grazing to such an extent that they may be classed as ungrazed, 391 acres. On the basis of the fire season of 1910, the records showed the average acreage per fire on nongrazed lands was 273; on understocked, 300 (one fire only); on normally stocked, 15.07; and on overgrazed, 4 acres.

On the Beartooth National Forest, Mont., in 1910, two sections of ungrazed timberland were burned over before a fire could be controlled. In contrast to this, another fire in grazed country, under similar conditions, burned barely an acre, although it was not discovered promptly.

The Bridger Forest in Wyoming reports a fire on a cattle range which was reached 4 hours after discovery by 4 men and was put under control in 12 hours, burning only 10 acres, while a fire on similar ungrazed area, reached in 3 hours by 9 men, took 2½ days to extinguish and burned 90 acres. The second fire cost four and two-thirds times the first, burned nine times the area, and did nine times the damage.

The Shasta Forest, Calif., reports a fire that was stopped easily when it reached sheep area. Another instance is recorded on this Forest where duff and litter burned for 6 weeks and outlived a 3 days' rain, as against an instance on a grazed area, with more underbrush, where a fire burned out in 3 days. All the timber was killed in the first instance, while only a small amount was destroyed in the second.

LIGHTNING FIRES.

Next to carelessness and sparks from locomotives lightning ranks third as a source of conflagrations in the mountains. For the years 1906 to 1919, inclusive, lightning caused on the average 27 per cent of all fires reported.

Of 36 fires which occurred on one of the California Forests one season, 28 were caused by lightning. On the same Forest the preceding season 68 fires occurred, 21 of which were caused by lightning. Lightning starts fires most often along the summits of ridges, remote from settlements, where they are controlled with difficulty unless there is some deterrent factor, such as grazing or barren conditions. The time-worn theory that "lightning never strikes twice in the same place" may be modified to this extent: Lightning strikes very often in nearly the same places—it has its zones, in other words, where its appearance may usually be counted on with each electric storm. For the past 15 years, with the accumulation of data on causes and locations of fires, these lightning zones could be mapped out and possibly systems of grazing use introduced that would more or less automatically control fires at the start. If these lightning zones were mapped out, they would doubtless show a markedly close relation to certain types of topography and certain more or less localized sections of many Forests. If the hazard is large on account of heavy undergrowth or herbaceous cover, it might be feasible to introduce sheep grazing as a measure of control.

Instances are reported where lightning started 7 fires, 5 in country grazed by sheep and 2 outside, and the 5 on the sheep range needed no attention, while the 2 outside burned until handled by forest officers. This shows 71 per cent better control on grazed areas. An Oregon Forest reports instances where lightning fires have died out of their own accord on grazed areas. Another Forest in the same State cites a number of cases where trees have been fired by lightning and the fires extended only a few feet beyond their bases on grazed areas, while on similar areas ungrazed they spread rapidly. Similar reports are recorded from Idaho, Montana, Arizona, South Dakota, and other States. There is need for a closer study of lightning fires as they relate to certain types of topography or localized sections of the Forests with a view to closer application, if practicable, of grazing uses to fire control.

DRIVEWAYS AND TRAILS.

One of the most marked examples of the benefits of grazing use is in the effectiveness of stock driveways and trails in the control of fires after they have started. Few fires which gain any headway are controlled by direct attack. Advantage is taken of every available artificial and natural means of combating them. Many portions of the National Forests lack roads and trails, and while appropriations for these purposes have been much more liberal in recent years and their expenditure as much as possible is directed to the opening of sections of country which are inaccessible, or have the greatest fire hazard, it

will require years to complete the work. On such areas driveways and stock trails are especially useful in fire fighting.

Stock driveways are usually located along ridges or roads, thus furnishing the best lines of defense or attack. Their usefulness depends upon the kind of country traversed and their effectiveness upon the intensity of use. The wisest possible use should be made of them. And not only should those existing be employed but new ones should be laid out or old ones changed wherever advisable. If not fully efficient in actually stopping fires, they serve as excellent points from which to backfire.

The San Francisco fire in 1906 was stopped partly because it came to a broad fire line—Van Ness Avenue—a fire line comparable to many roads or trails or natural barriers in the National Forests. But Van Ness Avenue in itself was not an efficient barrier. Had it not been for the use of dynamite, which reduced inflammable material or rendered it less inflammable, much less of San Francisco would have been saved. The incident points to intensity of use of these features of the Forests to the point perhaps of local damage at strategic points of fire vantage.

The Wenaha Forest reports fires checked at least 50 per cent by driveways. The Gallatin Forest reports that in the case of a severe fire in 1910 a driveway was crossed only where the fire was burning in the crowns of the trees. Many other instances are recorded of the efficiency of driveways in preventing the spread of fires. Specific examples are graphically shown on the accompanying map of a portion of the Wenatchee Forest (fig. 1).

Trails made by live stock have also been found to contribute materially to fire protection in serving as fire lines and making areas more accessible. Of 250 fires reported on the Harney National Forest in three years, 75 per cent were checked by making use of roads and trails of different kinds.

On many National Forests practically all of the trails traveled, outside of a few main trails, have either been built by stockmen or opened up by live stock. They are frequently used as short cuts to get to fires and could well be tied in to the main roads and trails in connection with the fire plan. Driveways and trails should be located where they will give best fire service, although this may entail the sacrifice of some young growth.

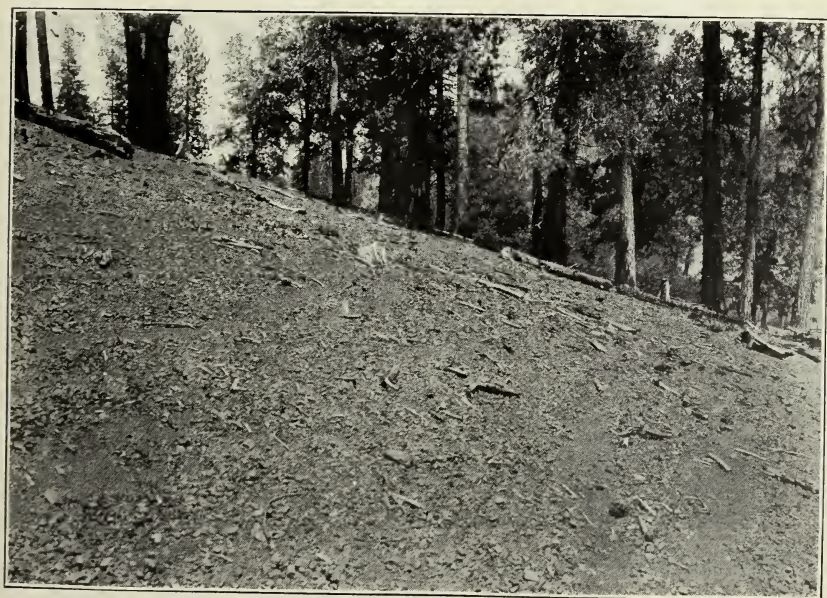
ADDITIONAL PERSONS IN THE FORESTS.

Grazing necessarily brings a large number of people into the mountains to care for the stock—fully 25,000 persons. The presence of this additional population introduces a certain fire hazard. This was truer formerly than now, and the hazard at the present time, taking the Forests as a whole, is very small—almost negligible.



F-75463

FIG. 1.—HARMFUL EFFECTS OF OVERGRAZING BY GOATS TO REPRODUCTION AND SOIL COVER. NEW MEXICO.



F-24969

FIG. 2.—HARMFUL SHEEP GRAZING SHOWING DESTRUCTION OF SURFACE. CALIFORNIA.



F-91509

FIG. 1.—FIRE MENACE OF INFLAMMABLE GRASS ON NON-GRAZED FOREST AREA. OREGON.



F-77603A

FIG. 2.—FIRE MENACE IN FOOTHILL COUNTRY. CALIFORNIA.



F-93222

FIG. 1.—BREAKING UP LITTER AND MAKING FORESTS CLEANER. COLORADO.



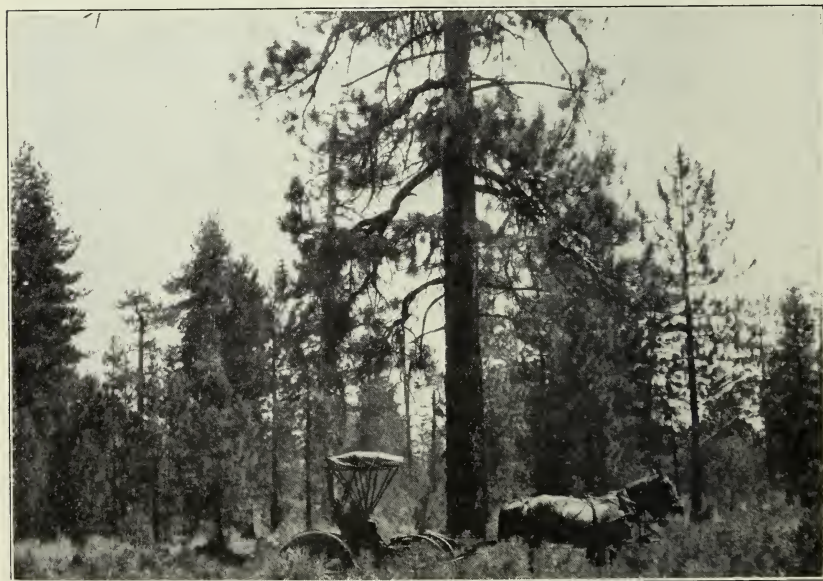
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FIG. 2.—SHEEP HELP TO CLEAN UP OLD BURNS AND REDUCE FIRE HAZARD.



F-11624A

FIG. 1.—FIRE LINE DRIVEWAY 12¼ MILES LONG. PORTIONS PASS THROUGH HEAVY TIMBER. COLORADO.



F-90155

FIG. 2.—YELLOW PINE REPRODUCTION. THIS AREA WAS CONSERVATIVELY GRAZED BY SHEEP FOR 40 YEARS AND FIRES KEPT OUT. THE BALANCE IN FAVOR OF LIVESTOCK USES. CALIFORNIA.

This change in conditions may be attributed to (1) fire laws and regulations, (2) change in sentiment, (3) absence of range wars and disputes among stockmen, and (4) growing demands for range.

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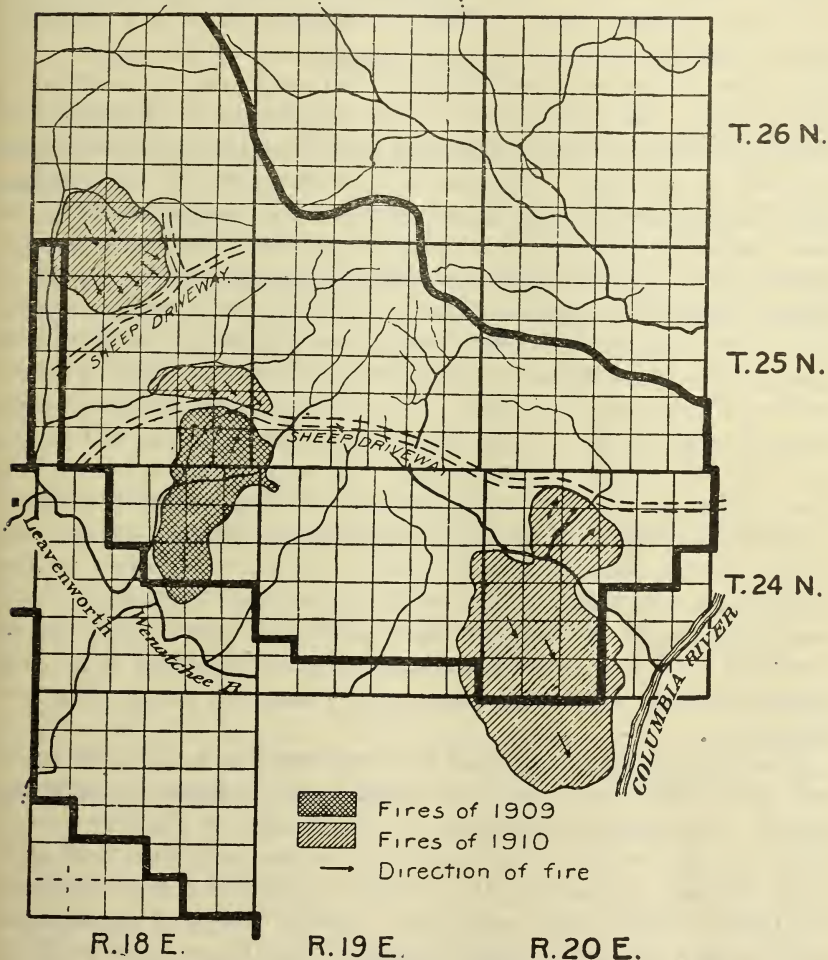


FIG. 1.—Fires stopped by sheep driveways.

One of the principal conditions in the approval of grazing applications is a clause under which the permittee agrees to bind himself and his employees to use every precaution with fires and to assist in extinguishing them upon and in the vicinity of his allotment. The grazing privilege has become so valuable that stockmen can not afford to have their permits canceled for any breach of the agree-

ment, and this, together with the deterring influence of strict State and national fire laws, has had its effect in rapidly reducing to a minimum the fires which may be attributed to the presence of stockmen on the Forests.

The fact of the awakened or changed public sentiment with reference to forest fires, as it relates to the West, also must not be overlooked. While with a very small number of stockmen, largely among the more illiterate class of Mexican herders, there is a lingering belief in the idea that it is a good thing to burn off the ranges in the fall, there are few who now hold that the ranges can be benefited by this process. The large majority are unanimous in the belief that burning results in harm rather than benefit, and have for some time opposed all burning. Valuable feed is destroyed by the burning, and the permanent carrying capacity of the ranges lessened. In most cases it requires from one to three years or more for a range to recover from a severe burn, and during the interval the amount of forage produced is much lessened. Valuable weeds seldom recover from severe burns until after several years, if ever. In the mountains of the West it may be confidently stated that burning is not necessary to improve the range. It is an injury rather than a benefit. Grass, moreover, has become valuable and must be husbanded, and any kind of cleaning process which will deprive the stock of feed, even temporarily, results in distinct economic loss to the stockmen.

So the advantages of having the grazing permittees and their employees on the Forests during the fire season far outweigh the disadvantages. In fully 90 per cent of the cases stockmen or their employees render valuable service in putting out small fires, and are available with men, supplies, and equipment for larger fires. The question arises: How may *more* use be made of the grazing permittees?

It is suggested that some plan be inaugurated on each Forest which will give official and honorable mention to stockmen or their employees who render independent service, similar to the plan now in effect in some sections of giving sheep herders who have been especially diligent in observing the grazing regulations a card commending them to other sheep employers. Special letters of appreciation could be sent out by the district forester. Local newspaper publicity could also be given to noteworthy cases. Ordinary cooperation which stockmen agree to in their applications should not be thus recognized, but those things which stand out like the following instances, which are of Service record:

"Two herders saved the day in the case of one fire."

"Nine permittees fought fire 48 hours without recompense."

"A herder took up the patrol of a regular ranger during the latter's illness."

"One permittee came 30 miles and fought 100 hours without rest and said he expected no pay for his services."

The regular fire plans should take into account not only the ranches in and adjacent to the Forests, but should also include the temporary summer camps so as to make the greatest possible use of these men and their equipment. The protective force of approximately 2,500 men can thus be augmented by fully 25,000 persons, more or less available for fire duty in emergencies.

CONCLUSIONS.

Recognizing the value of normal grazing in fire protection of timberlands, a study of its application to the National Forests suggests:

- (1) The timely use of present ranges or the removal of rank vegetation before it becomes unpalatable.
- (2) The utilization of all suitable unused lands by the development of water and trails and the elimination or control as rapidly as possible of all factors which prevent present use.
- (3) The closer consideration of the class of stock to be grazed where fire protection is involved.
- (4) The location of driveways and trails so as to form the most efficient fire lines and means of communication.
- (5) The overgrazing of strategic points. Minor damage at such points may result in saving large areas of forest from destruction by fire.
- (6) The study of lightning fires on the Forests with a view to determining whether lightning zones exist and whether grazing may be made to assist in preventing the spread of fire.
- (7) The fuller enlistment of the moral and active support of some 25,000 additional persons in the Forests on account of grazing uses.
- (8) The closer correlation of the live-stock industry of the Forests with the fire-protection plans.

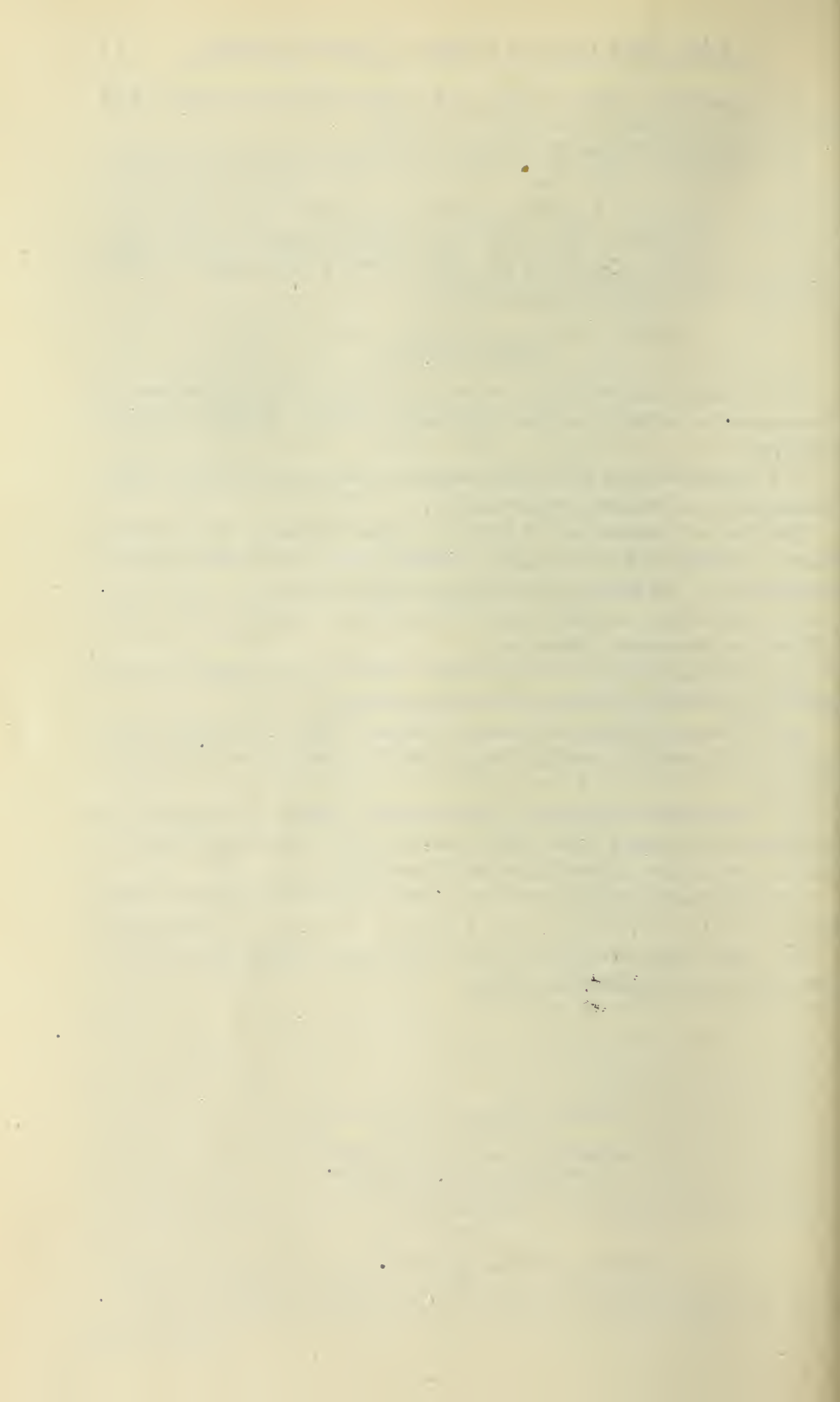
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MAINTENANCE OF THE FUR SUPPLY

NED DEARBORN

Assistant Biologist, Bureau of Biological Survey



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 135

Contribution from the Bureau of Biological Survey

E. W. NELSON, Chief

Washington, D. C. *

November, 1920

UNLESS fur-bearing animals are rigidly conserved the time is not far away when many of the more valuable species will be exterminated and furs will be worn only by the very rich. This fact is recognized by the fur trade generally and by individuals who have made a study of the subject.

Maintenance of the fur supply involves the protection of the available stock, especially when the pelts are not prime, and the production of the animals under controlled conditions.

Fur animals should have legal protection by the enactment of uniform legislation in States having similar climatic conditions and by the strict enforcement of laws when passed.

A greatly increased production can be made possible only by domesticating the animals, just as live stock are now raised; and by establishing preserves for them where they may be safe from molestation. Protected areas stocked with the best fur animals that can be found will become centers from which choice breeding stock can be obtained for establishing other preserves and for private use.

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MAINTENANCE OF THE FUR SUPPLY.¹

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TO DIRECT ATTENTION to the great commercial importance of fur; to emphasize the need of maintaining the supply, which lately has been declining at an alarming rate; and to point out ways by which this supply may not only be maintained as to quantity but improved as to quality, is the purpose of this circular.

The subject is discussed from the viewpoint of the farmer, to whom fur-bearing animals, if rightly managed, will be a source of interest and profit. The farmer should know that peltries are prime only about two months in the year, and that it is as unwise to take them when unprime as it is to harvest unripe or overripe fruit. He should know, also, that while foxes, skunks, minks, and several other small fur bearers are carnivorous, very few of them ever taste the flesh of poultry; the farmer who kills these animals at every opportunity will, if consistent, kill his poultry whenever a few hens raid his garden. Among fur animals, as among men, the proportion of criminals is relatively small.

The unprecedented prices lately paid for peltries make this an opportune time to urge a reasonable and practical attitude toward fur bearers on the part of the farmer, who actually controls the animals living on his property, although he is subject to the same laws as are other people, so far as capturing them is concerned. When once he accepts the fact that fur animals are worth tolerating—for he has neither to feed nor shelter them—he will take steps to secure a dependable harvest of fur every year. He will not permit poaching on his property and he will himself hold sacred the dens of the fur bearers. A hollow sycamore or oak, of no value for lumber and scarcely worth felling for firewood, may keep him

¹ Read before the second annual stated meeting of the American Society of Mammalogists, New York City, May 4, 1920.

in raccoon-skin overcoats. The returns from a fox den may easily be worth more to him than the income from a thousand-dollar Government bond.

THE FUR TRADE.

The commercial history of America begins with fur, and from the early days down to the present this has been an important article in our domestic and foreign trade. There are few commodities in common use which distribute their benefits so widely. From the country boy who traps a few muskrats to the professional trapper patrolling a hundred miles of territory, the money received for pelts goes at once into various channels of circulation.

For upward of 300 years America furnished raw furs that were dressed and manufactured in Europe, many of them to be returned to this country for final use. Since 1914, however, the center of the world's fur trade has been transferred from Europe to the United States. The greatest fur sales in history are now being held here, and all branches of fur dressing, dyeing, and manufacturing are being successfully carried on by American enterprise. The amount of capital invested in the American fur trade is vastly greater than ever before, and many thousands of people derive their support from it. To both capital and labor it yields abundant returns.

Most of the fur goods produced in America are manufactured in or near New York City, where in 1918 there were about 60 dressing and dyeing plants, 500 dealers, 1,200 manufacturers, 18,000 operatives, and an investment estimated at between \$200,000,000 and \$300,000,000.

The effect of the World War on fur dressing and dyeing in this country is clearly shown by the change in ratios between the dressed and raw skins imported in 1914 and 1919, respectively. (See Pls. I and II.) In 1914 dressed skins imported were worth \$3,500,000, while raw-skin imports were worth \$7,500,000, the ratio of dressed to raw being about 46 per cent. In 1919 we imported \$4,000,000 worth of dressed skins and \$69,000,000 worth of raw skins, the ratio between dressed and raw dropping to 6 per cent from the 46 per cent of five years earlier. Members of the Fur Dealers' & Buyers' Association of Greater New York in 1919 dressed \$27,000,000 worth of furs and dyed more than \$16,000,000 worth. It may be safely assumed that from this time forth America can readily dress, dye, and manufacture all the furs she can possibly produce.

The most striking fact relating to the fur trade during recent years is the rapidity with which values have advanced and the surprising heights they have attained. For many months it seemed as if the pinnacle had been reached, yet each succeeding sale set a new record. Not only did prices advance, but skins formerly re-

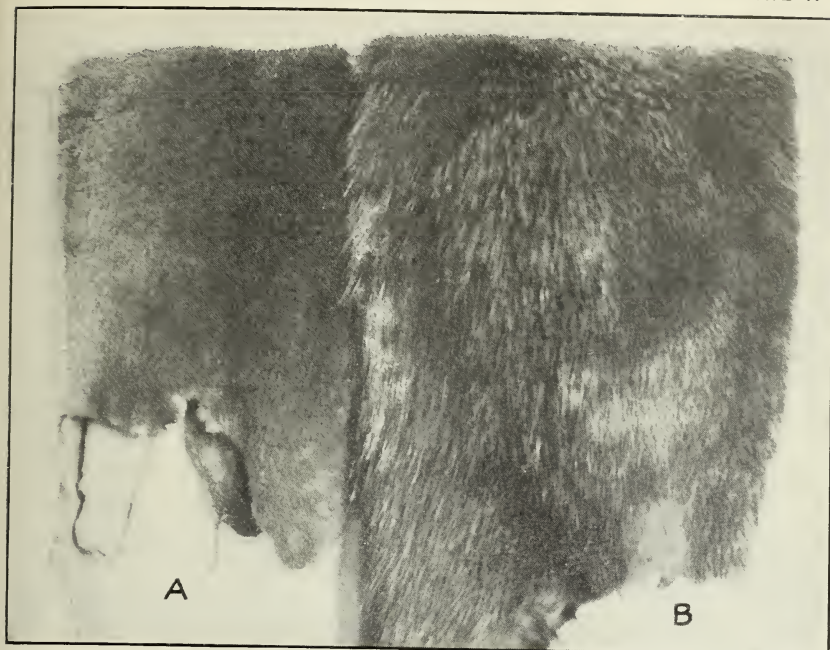


FIG. 1.—BEAVER SKINS.

B1417M

A, Plucked, as the skin comes from the hands of the fur dresser; B, Unplucked, as the skin dresser receives it.

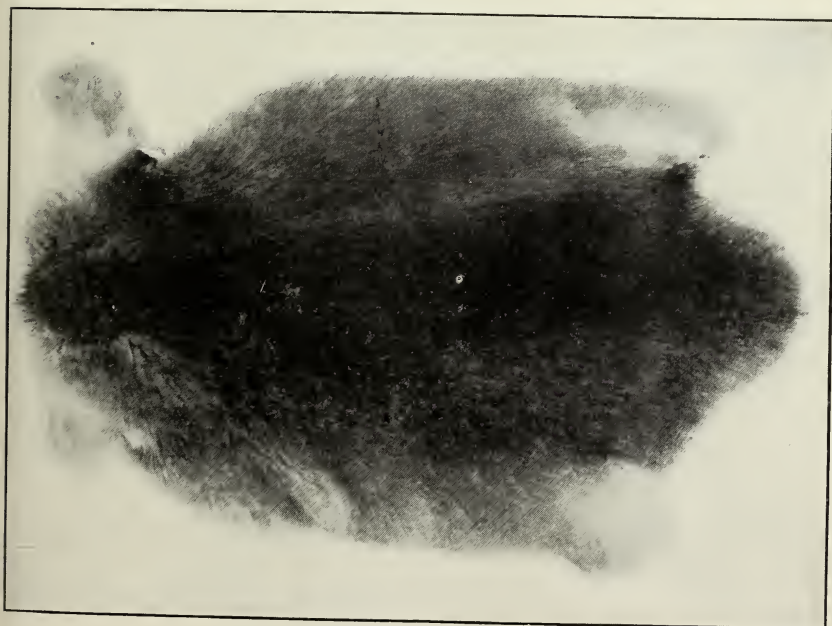
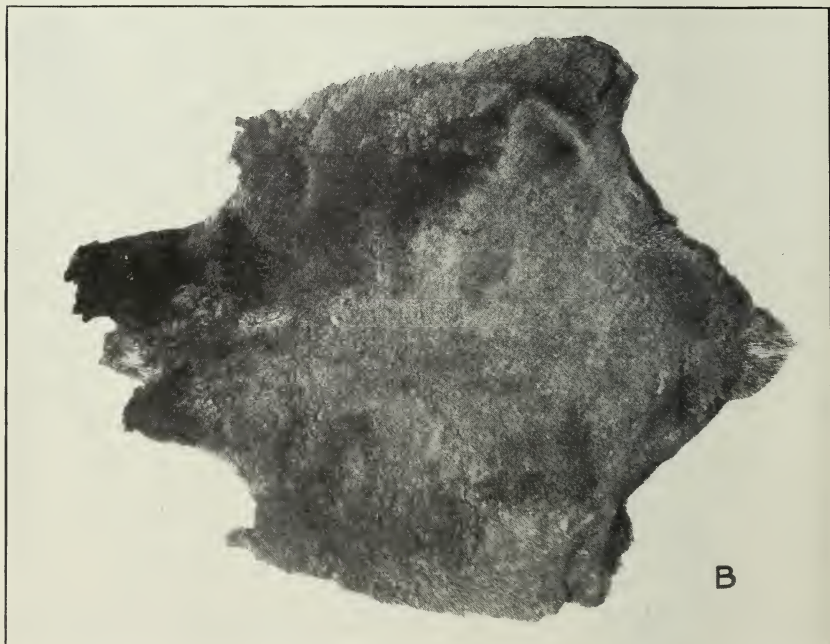
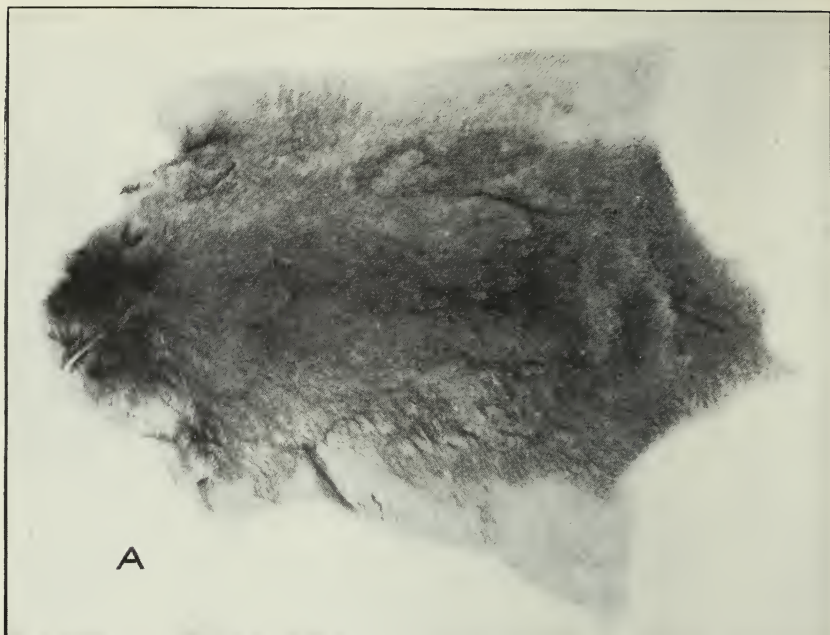


FIG. 2.—DRESSED MUSKRAT SKIN.

B1423M

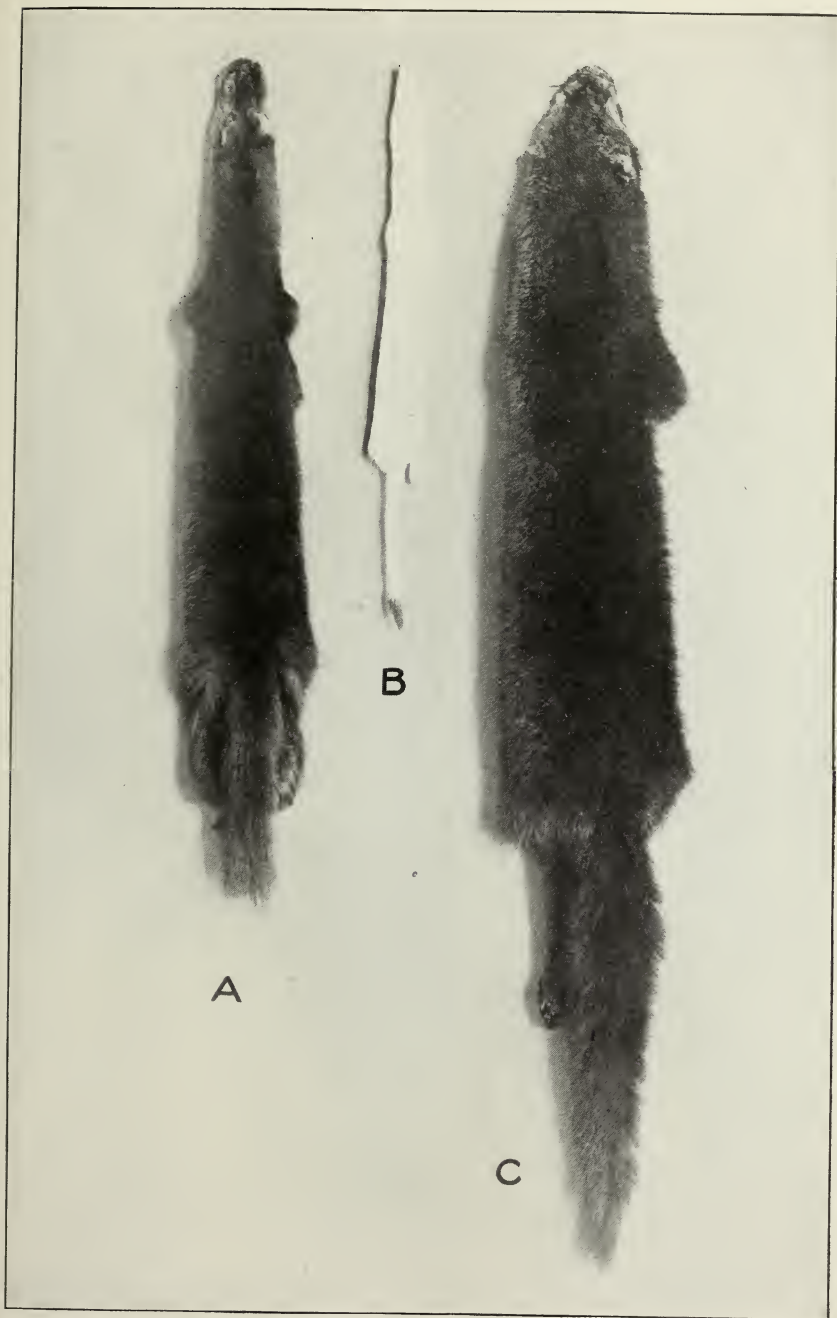
This skin is in the natural state. Plucked and clipped skins are shown in Plate II.



DRESSED MUSKRAT SKINS.

B1424M; B1425M

A, With guard hairs plucked out: *B*, With guard hairs plucked and the underfur clipped and dyed, in which condition it is known as "Hudson seal."



THREE VALUABLE FURS.

B1422M

A, Marten; *B*, weasel, or "ermine"; *C*, fisher. Martens and fishers are no longer common in any part of the United States, and in 1920 their skins sold, respectively, at \$201 and \$365 each, whereas five years earlier they sold at \$15.20 and \$25.50, respectively.



RACCOON SKIN.

B1420M

Taken in southeastern Wyoming. The 2-foot rule shows the size of the pelt.

garded as having little or no value as fur became popular under various trade names. A comparison of the highest prices at the October sales in St. Louis in 1915 with those in 1919 illustrates the remarkable increase in fur values: Beaver advanced in these four years from \$17 to \$38.50, otter from \$14 to \$101, muskrat from \$0.36½ to \$5.10, red fox from \$15.20 to \$64, fisher from \$25.50 to \$205, skunk from \$3.36 to \$10.60, and marten from \$15.20 to \$145. (See Pls. III and IV.)

The crest of the rising wave of fur values was reached in the auction sales of February and March, 1920, when the following were the highest prices paid: Weasel, \$4.10; muskrat, \$7.50; skunk, \$12.25; raccoon, \$30; lynx, \$66; red fox, \$71; mink, \$75; otter, \$105; marten, \$201; and fisher, \$365. These inflated values, which involved an enormous amount of money for financing the fur industry, coming at a time when banks were showing an inclination to withhold credit, reacted on prices and caused a decline of about 25 per cent in the May sales of 1920, although they still averaged higher than in the spring of 1919. Fur continues to be fashionable, however, and while prices may decline somewhat, they probably will be prevented from going very low by the continued demand for fur and the reduced numbers of fur-bearing animals.

A concrete example of the rise in fur prices is afforded by the actual record of one man's fur-lined overcoat. This coat, lined with mink, in 1913 cost \$500. After wearing the coat two years the owner sold the mink lining for \$1,000 and replaced it with nutria at a cost of \$150. Two years later, in 1917, he had the nutria lining removed and sold it for \$250. A muskrat lining was then put in the coat at a cost of \$55, which, in 1919, was in turn removed and sold for \$300. The original purchaser still has the shell.

Although fur garments bring what seem exorbitant prices, the trapper regards present fur values with the utmost complacency. A fur buyer in Illinois recently told of two boys near Ottawa who trapped along the Illinois River during the winter of 1919-20 and sold \$1,000 worth of skunk, muskrat, and mink skins, and further stated that many other boys around the country did quite as well. Alaskan trappers, in 1918, sold furs valued at \$1,363,600.

Fur animals are profitable to the Government as well as to individuals. The sealskins taken on the Pribilof Islands by the Bureau of Fisheries in 1919, to the number of 27,821, were worth to the Government nearly \$4,000,000. From these same islands the Government harvested 938 blue foxes in 1919, the pelts having a value of \$165,000. The skins of bears, bobcats, coyotes, mountain lions, and timber wolves killed by predatory animal hunters of the Biological Survey in 1918 and 1919 brought nearly \$160,000, and since these operations began, in 1915, \$234,762 has been turned into the Treasury

from this source. (See Pl. V.) In California the asset value of wild fur bearers to the people of the State has been estimated at \$7,125,000, as the annual catch of fur in the State brings about 4 per cent of this huge sum. By proper conservation it might readily be doubled.

Although America still produces a large quantity of fur, about half the skins disposed of at American auction sales are of foreign origin. The total value of furs imported into the United States in 1919 was more than \$76,000,000. Our foreign trade in this industry is of no little importance, as fur is one of the few commodities that Europe can sell us. It is estimated that the money spent in America yearly for fur garments is well over \$100,000,000. The gross trade of fur merchants in New York alone during 1919, including exports, imports, and domestic trade in raw and manufactured furs, amounted to upwards of \$375,000,000.

SUPPLY OF FURS WANING.

The traffic in fur is so extensive and profitable that fur dealers are taking definite steps to keep up the demand for it. The management of the largest auction fur sales company in America planned to spend \$100,000 during the year 1920 in a campaign designed to persuade people to wear fur at all seasons of the year. A prominent advertising agency was awarded the contract to direct this campaign through some of the most popular and widely circulated magazines in the United States.

This movement to stimulate fur sales will inevitably tend to intensify the pressure on fur-bearing animals, which have been gradually decreasing in numbers as a result of excessive trapping, clearing of forests, and draining of marshes. Already beavers and martens, two very important fur bearers, have been exterminated over a large part of the country. Even in Alaska, the last stronghold of fur bearers on United States territory, these animals became so scarce that complete protection for them for a term of years was advocated by Alaskan trappers. As a result of their express request a close period was declared and is still in force.

High prices of furs are equivalent to large bounties or rewards for killing fur animals, and unless steps to counterbalance them are taken immediately we may look to see these animals practically exterminated in many places. Reports from raw-fur buyers indicate that fur animals have decreased greatly during the last decade, several of the estimates running as high as 50 per cent. From some of the best fur regions in Canada come reports to the effect that fur animals are extremely scarce. A raw-fur buyer in Boston, speaking of muskrats, states that the supply in the winter of 1918-19 was 50 per cent short of normal and that of the following winter was 50 per cent less again. In the State of Wisconsin, trappers in 1917 took

over 800,000 muskrats, in 1918 they took less than 300,000, and in 1919 only about 150,000. These decreases occurred in spite of the fact that there was an increase of 10 per cent each year over the previous year in the number of trappers' licenses sold. An Illinois writer in February, 1920, referring to the Kankakee River district, asserted that the fur-bearing animal supply could not possibly stand the amount of trapping induced by current prices for fur, and that if the present condition should continue for a few years the supply in settled districts would come to an end.

PROTECTIVE LAWS FOR FUR ANIMALS.

There is a loss of one-fourth of the full value of furs because so many of them come to market unprime. It is generally agreed that killing fur animals in the breeding season and before family groups break up and disperse in fall is a wasteful practice. In considering ways for preventing such waste the first course that has suggested itself is to invoke the aid of appropriate laws. Forty States have enactments establishing close seasons for fur bearers and 16 States have given rare and valuable animals, as the beaver, otter, and marten, the benefit of a close period covering five years or more. Inasmuch as comparatively few of the unprime skins coming to market come from the eight States without close seasons, it is evident that in some States at least the laws protecting fur animals are either ineffective or inadequate.

In many States the open season for trapping is too long. It should not cover more than two months. The open season for beavers and muskrats should not begin earlier than January, as these animals prime late, while for the other fur bearers it should not begin earlier than November nor end later than January. Uniform laws throughout the United States prohibiting traffic in unprime skins of American fur animals, excepting wolves and wild cats, would be salutary. Such laws would apply especially to dealers and would be welcomed by many of them; they are not only well aware of the need for more and better fur, but have under consideration the propriety of refusing to handle skins that are evidently taken out of season. The attitude of intelligent fur dealers toward trapping out of season is well illustrated by a full-page advertisement in a magazine devoted to rural interests, paid for by a prominent fur house, and entirely devoted to arguments for the capture of fur animals only when their skins are prime and for obeying laws protecting them. Proprietors and managers of large fur houses stand ready to support any reasonable movement to keep up the fur supply.

In several States the law provides that trappers must buy licenses in order to support a warden system for the enforcement of laws protecting fur animals. In a few States trappers are also required

to report how many animals of each kind are taken. It would be well for every State to require such reports, as this is a convenient way of obtaining the statistics which are necessary to inspire people with a desire and a determination to make fur a regular and valuable farm and forest crop.

RESULTS OF PROTECTION.

Wild creatures quickly learn where they are safe from molestation, and in such places their fear of man disappears in a surprisingly short time. (See Pl. VI, B.) Wild waterfowl in city parks throng around visitors who feed them as if they were domesticated. The fact that animals very quickly learn to appreciate a sanctuary was forcefully brought out a few years ago at Buffalo Park, near Wainwright, Canada, when a protest was made by residents in the vicinity that the park was recognized as a haven of refuge by coyotes. When the farmers started to hunt them, all the coyotes made a bee-line for the park, where they evidently knew they were safe. Wardens who patrol Jasper Park and the adjacent country in northern Alberta report that as soon as the hunting season arrives all the wild animals take refuge in the park.

A close period for beavers for several years past has virtually made a temporary preserve of an entire Province, so far as beavers are concerned. During the first open season the farmers there will probably harvest about 15,000 beaver pelts. Now, instead of having a catch of 15,000 the first year, a catch of 7,000 the second year, a catch of 3,000 the third year, and then another closed period for perhaps 10 years, suitable areas might be set aside where beavers and other fur bearers would be continually protected and from which would come an overflow that would furnish a reasonable supply of skins every year continuously. (See Pl. VI, A.)

A striking example of the benefits derived from setting aside a preserve for fur animals is to be found in Laurentides Park, in the Province of Quebec, where many people, in the habit of hunting in that region before the park was formed, found it very hard to keep out after it was set aside as a sanctuary. Finally, however, they held a conference and found on comparing notes that while they no longer entered the park they were handling three times as much fur as when they were admitted to it.

FUR FARMING.

The first landowners to appreciate the possibility of turning into ready cash the furs produced annually on their land were those in possession of marshes inhabited by muskrats. One of the most progressive of the muskrat farmers counts the muskrat houses on his marsh in fall and then decides how many animals may be safely



FIG. 1.—OTTERS.

B1834M

Photograph taken in National Zoological Park, Washington, D. C. Otter skins have advanced in price from \$14 to \$101 during the years of the war, and the crest seems to have been reached in 1920, when the highest price paid was \$105. This is about half the price then paid for marten, and less than a third the price paid for fisher.



FIG. 2.—SKINS OF PREDATORY ANIMALS.

B1427M

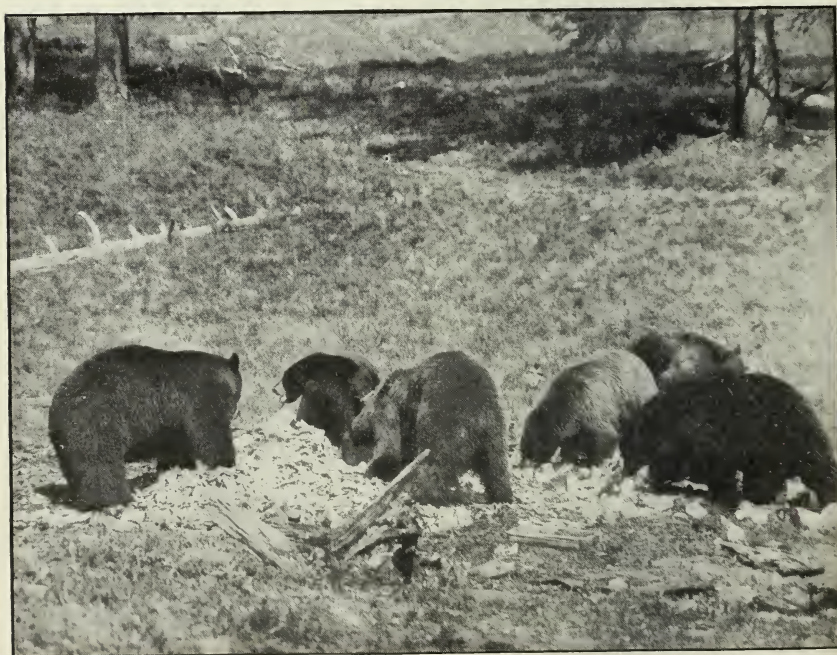
The February catch of a hunter of the Biological Survey in Montana. Most of the skins are of coyotes, the animals having been killed by poisoning operations, a measure necessary to protect live stock from their depredations. The skins are sold and the proceeds turned into the Treasury of the United States.



B13094

FIG. 1.—BEAVER PASTURE.

Timber felled by the animals for constructing their dam. This may be seen in the middle foreground. View taken near Cascade, Colorado, in 1910.



B867M

FIG. 2.—BLACK BEARS FEEDING.

These usually timorous animals search through the refuse in a canyon of the Yellowstone National Park without fear, as they have learned that there they are safe from molestation.

captured and how many will probably be left for breeding stock. Marsh owners in Dorchester County, Md., harvest on the average from 100,000 to 125,000 muskrat skins a year. There is a market for the meat as well as for the fur. A single Baltimore firm handles from 25,000 to 30,000 muskrat carcasses each season and is unable to supply the demand at that. The best hotel in a Maryland town of a population of about 9,000 offers a choice on its bill of fare between muskrat meat, under the name of marsh rabbit, and roast beef. The price of muskrat carcasses as sold by trappers in the spring of 1920 ran from 25 cents each early in the season to 10 cents each near the close. Incidentally, these marshes, which formerly were considered to be practically of no value, now bring from \$30 to \$40 per acre.

Experiments in propagating fur animals in confinement have been tried with varying results. The World War interrupted them, but now the young men who carried them on are back on their farms again and have resumed their efforts. The Department of Agriculture has been experimenting along this line for several years. It has been demonstrated that silver foxes, blue foxes, skunks, and muskrats can be farmed profitably under suitable conditions.

For skunk farming it is necessary to have a reliable source of cheap food, as the value of skunk pelts is not sufficient to justify much outlay. In the case of foxes, the margin of profit makes it unnecessary to consider the cost of food. Minks have been bred in confinement, but they are not hardy and can not be handled successfully unless there is a reliable supply of fresh meat and fresh fish constantly at hand. (See Pl. VII, A.) Martens and fishers are hardy in captivity but can rarely be induced to breed. None of the other fur bearers have been tested enough to show whether they may be propagated in confinement. There is no doubt, however, that skins from domesticated fur bearers will continue to be used in increasing quantities, and that ultimately furriers must rely largely on them for the support of their trade.

LOCAL ATTACHMENTS OF ANIMALS.

Each wild animal has a special range on which it lives and to which it becomes attached by association. In the same way an animal that is well provided for in confinement soon becomes contented and attached to its surroundings. Minks that have been in captivity for a few months have been known to return to their dens voluntarily after having escaped. Martens seem to do this invariably; at least numerous instances have been recorded in which they have returned to their cages and been recaptured.

A muskrat that had been kept in a cage for several months at the National Zoological Park, in Washington, was returned to its native waters in Rock Creek when cold weather came on, as it was not thought worth while to keep it through the winter. The morning

after its liberation it was found back again on the hill near its cage, and it remained in the vicinity until finally it fell into a post hole and died.

A red fox that had been kept on a ranch with cross and silver foxes was turned loose, as its owner did not wish either to feed or to kill it. The guard fence surrounding this ranch consisted of a high board fence, the owner of the ranch living in a cabin within the stockade. Every morning, almost invariably, when the stockade door was opened the red fox was waiting to come in and visit its former comrades. After a little while it began to dig a den near the highest corner of the yard and spent about half an hour each day at work upon it. Apparently this fox came back from pure love of locality, as it received no feed at the ranch after its liberation, and after spending about an hour at the ranch each day it returned to the forest. Unfortunately for this fox its association with man led it to follow trails and rob Indian snares of rabbits, till finally its hide hung in an Indian wigwam.

FUR-ANIMAL PRESERVES.

The attachment shown by animals for their accustomed range, their appreciation of sanctuaries wherein they are safe, and the increase shown by fur bearers that are well protected indicate that it is practicable to select large tracts of land of a suitable character and make them permanent fur-animal preserves, where dens and feed will be provided and the animals will be retained merely by their rations and their local attachments. Such preserves would soon become centers of radiation from which would come a constant overflow of fur bearers. Private preserves may be used to obviate some of the difficulties in the way of farming certain fur animals in small yards, either because of their failure to breed freely in confinement—as martens and fishers—or because the value of their skins is not sufficient to pay returns on the cost of building yards and attending to their daily needs, in which latter category fall skunks, raccoons, and opossums. The Forest Service, ever alert to husband natural resources, has proposed that National Forests be administered as fur-animal preserves jointly by the Forest Service and the State game officials for the benefit of the State. It estimates that the National Forests of Colorado can be made to produce \$100,000 worth of fur annually and that the forests of Wyoming can be made to produce as much as those of Colorado simply by conserving the wild animals already there. The report in which this suggestion was made incidentally brought out the fact that beavers are useful in storing water, which keeps the trout streams running during the dry season. In one instance cited, when the irrigation reservoirs had all been drained during a protracted drought and crops were drying up, beaver dams were opened on four different creeks in the mountains,



B1426M

FIG. 1.—FEEDING MINKS.

View taken on the Biological Survey Experimental Fur Farm in the Adirondacks. This illustrates the fact that wild fur bearers under domestication may be as friendly with their keepers as are the other live stock of the farm.

B1421M

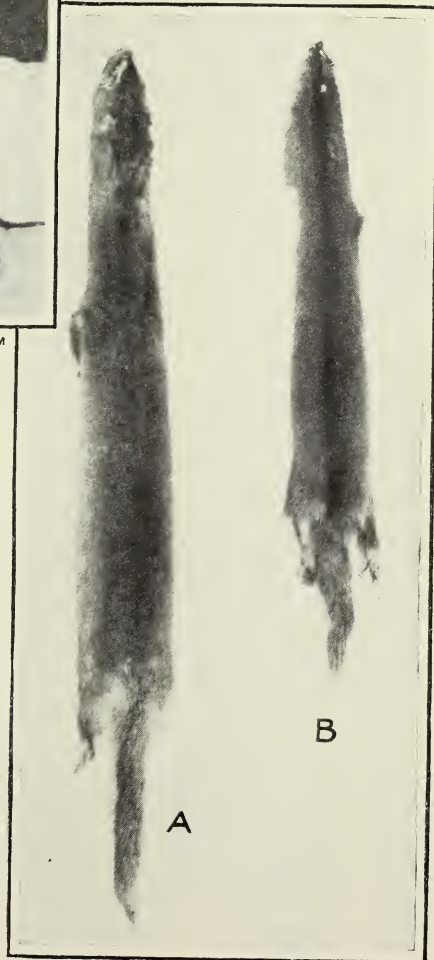


FIG. 2.—MINK SKINS.

A, From Northwestern Alaska, pale, coarse haired, and very large; B, from Labrador, dark, fine haired, and comparatively small. Mink skins from Labrador to Hudson Bay and southward to the Adirondack Mountains and Nova Scotia are the best in the world. The highest price paid for skins in 1920 was \$75.





SKUNK SKINS.

B351M; B352M

PLATE VIII: A, Full stripe; B, narrow stripe. PLATE IX: A, Short stripe; B, black. The less white there is on a skin the more valuable it is.

and sufficient water was thus obtained to tide the crops over until the fall rains came.

The characters of North American mammals and their geographical distribution are now well known. It is known, for example, that the largest minks come from northwestern Alaska, while the best-furred minks are found from the Adirondacks to Nova Scotia and northward to Labrador (see Pl. VII, B); that the largest well-furred skunk is the northern plains animal, while the region in which the largest proportion of black, well-furred skunks are found extends from eastern Canada southward to Pennsylvania and northern Indiana; and that the so-called black muskrats of the fur-sales catalogues come mainly from the marshes of Chesapeake Bay.

It is thus possible to stock preserves with animals of the very highest quality from the regions where such animals are found, or by culling out the poorer specimens in localities where more than one grade is found, as in the case of skunks. (See Pls. VIII and IX.) It has been estimated that a year's catch of skunks in New York State is worth \$1,000,000. Only one-fifth of them are black or short striped. If all were of this higher grade they would be worth \$3,000,000. Experiments in breeding skunks have shown that black parents regularly produce black offspring. A preserve stocked with black skunks would eventually double or treble the value of the catch of skunks in the territory surrounding it.

Furthermore, skunks are the best wild-animal friends the farmer has, and there ought to be at least three times as many of them as there now are. Almost any farmer might have two or three dozen skunks at work for him destroying mice, grasshoppers, crickets, and white grubs and furnishing him from \$50 to \$100 worth of fur a year, if he would but respect their dens, keep his poultry in skunk-proof yards, kill an old horse for them every fall, and be tactful when he meets them in the evening.

Federal, State, and private preserves might be stocked with fur-bearing animals, as public and private waters are stocked with fish. The Federal Bureau of Fisheries and numerous State fish and game commissions, fish hatcheries, game farms, and game preserves have been established for the benefit of sportsmen and of those who handle and consume fish. The results of these movements for increasing the supply of game and fish certainly justify the adoption of similar means for multiplying fur-bearing animals, especially when the relative importance of fur and game, from the industrial and commercial point of view, is considered.

Objections are likely to be raised by poultry raisers and sportsmen against a proposition to increase the numbers of fur animals, several of which are more or less carnivorous. The poultryman's objection may be fairly met by the fact that he can use dead fowls as bait for these animals, and easily catch enough fur to pay for vermin-proof poultry yards. The abundance of both fur and game prior to the

advent of firearms and steel traps proves that fur animals are not fatally antagonistic to game.

SUMMARY.

Directly or indirectly, fur contributes to the support or comfort of a large proportion of our population. We import as much fur as we produce. In other words, we could sell at home twice as much fur as we are now producing—not to speak of the foreign demand.

The greater part of the fur grown in the United States comes from privately owned land. Landowners can increase and improve the fur taken on their property and make of it a regular source of income.

A few species of fur-bearing animals have been domesticated, but with the single exception of the silver fox, none are being farmed extensively enough to influence the fur market.

Laws protecting fur bearers are helpful; at present, however, they are not preventing the animals from decreasing in number. There would be better fur and, in the long run, more of it if the open season were not more than two months long.

From what is known of game preserves and bird sanctuaries and of the behavior of fur animals that have been confined or protected in parks, the most logical step to be taken in attempting to maintain a satisfactory fur supply is to set aside fur-animal preserves and stock them with the best animals that can be found, the animals to be fed, furnished with dens, and allowed full liberty. From such preserves choice breeding stock could be obtained for private use or for stocking other preserves. The territory surrounding such preserves would soon become the choicest trapping regions in the country.

CONCLUSION.

In order to make fur-bearing animals a constant source of profit it is necessary that stringent protective laws for their conservation be adopted and enforced. Such laws should be uniform in States having similar climatic conditions. The open season should be short, and limited within the period when skins are prime. The use of poison, smoke, gas, or fumes in taking fur-bearing animals should be prohibited. Trappers should be licensed at a nominal fee and required to report the number and value of their catch at the end of every trapping season—this information to be published annually for the enlightenment of the public.

It is suggested that State game commissions and State agricultural experiment stations promote the raising of fur bearers, especially foxes, skunks, and muskrats, which are being propagated with success; that they investigate methods of feeding these animals and combating their parasites; that they undertake the production of improved strains by selective breeding; and that they study the relations of fur animals in general to agriculture and their value as an asset to the State.

THE WORK OF THE
NEWLANDS RECLAMATION PROJECT
EXPERIMENT FARM IN 1919

By F. B. HEADLEY
Farm Superintendent



Residence of the Superintendent of the Newlands Experiment Farm

UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 136

Contribution from the Bureau of Plant Industry
(Office of Western Irrigation Agriculture)
WM. A. TAYLOR, Chief

Washington, D. C.

November, 1920

THE WORK OF THE NEWLANDS RECLAMATION PROJECT EXPERIMENT FARM IN 1919.

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AGRICULTURAL CONDITIONS ON THE PROJECT.

CROP PRODUCTION AND VALUE.

In 1919 the net area under irrigation on the Newlands project was increased from 42,311 to 44,324 acres, which is an increase of 4.8 per cent over that of the previous year. The area devoted to alfalfa was increased from 25,277 to 28,042 acres, an increase of nearly 11 per cent. The areas planted to barley, oats, and potatoes were smaller than in 1918.

About 63 per cent of the total crop area of the project is in alfalfa, but this area produces about 80 per cent of the total crop valuation. Alfalfa is the great money crop, and upon it depends the more important live-stock industries. As shown in Table I, the value of the alfalfa produced in 1919 was \$1,485,600, while wheat, which ranks second, was worth but \$166,532.

The average gross income per acre to the farmers has nearly quadrupled since 1914, not so much because of the more efficient production but mostly on account of the increased market values of the crops. The average income derived by the farmers for each acre of crop produced since 1911 has been as follows:

1912.....	\$12.83	1916.....	\$20.11
1913.....	12.92	1917.....	35.90
1914.....	11.22	1918.....	38.43
1915.....	15.39	1919.....	42.54

Table I is compiled from data collected by the United States Reclamation Service. It shows the acreage, yields, and market values of all leading crops produced on the Newlands project in 1919.

TABLE I.—*Acreage, yields, and farm values of crops produced on the Newlands Reclamation Project in 1919.*

Crop.	Area (acres).	Unit of yield.	Yields.		Farm values.		
			Total.	Average per acre.	Per unit of yield.	Total.	Average per acre.
Alfalfa hay	24,188	Ton...	92,850	3.84	\$16.00	\$1,485,600	\$69.42
Alfalfa (planted in 1919)	3,854	do.	817	.21	16.00	13,072	3.39
Barley.....	519	Bushel	10,875	21.0	1.45	15,769	30.38
Oats.....	31	do.	937	30.2	.90	843	27.20
Wheat.....	5,423	do.	83,266	15.4	2.00	166,532	30.70
Potatoes.....	152	do.	24,366	160.3	1.50	36,549	240.45
Hay (except alfalfa)	351	Ton...	345	.98	15.00	5,175	14.74
Garden and miscellaneous crops	701					95,113	135.68
Pasture:							
Alfalfa.....						43,327	.....
All other	10,247					23,914	2.33
Irrigated without crop.....	1,028						
Total.....	46,494					1,885,894	42.54
Less duplications.....	2,170						
Net acreage.....	44,324						

In order to ascertain the progress made in the production of the leading crops, Table II has been prepared, showing the acreage and production of alfalfa, barley, oats, wheat, and potatoes from 1912 to the present time. It will be noted that the production of alfalfa has gradually and steadily increased, while the acreage devoted to all other crops has been subject to marked fluctuations. Wheat alone has shown a steady increase since 1914. Only about 1,000 acres of alfalfa land were broken up for other crops in 1919, while nearly four times that acreage was newly sown to alfalfa.

TABLE II.—*Acreage and production of leading crops on the Newlands Reclamation Project in the 8-year period from 1912 to 1919, inclusive.*

Year.	Alfalfa.		Barley.		Oats.		Wheat.		Potatoes.	
	Acres.	Tons.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
1912	12,912	33,595	2,259	74,792	399	16,875	2,484	40,600	483	65,633
1913	13,960	45,132	1,880	43,238	283	19,274	1,590	30,271	416	29,789
1914	13,212	59,873	1,329	31,084	417	18,000	1,446	29,164	283	23,800
1915	18,273	53,496	1,733	49,585	428	14,375	2,582	54,065	196	25,133
1916	19,541	61,756	1,658	52,000	107	4,566	2,861	57,733	177	29,400
1917	20,360	72,769	1,116	26,833	27	938	2,532	43,233	322	56,433
1918	21,542	77,442	1,374	35,333	44	1,856	5,024	98,800	334	50,833
1919	24,188	92,850	519	10,875	31	937	5,423	83,266	152	24,366

LIVE-STOCK PRODUCTION.

There has been a very decided decrease in the number and total estimated value of the live stock on the project. Only the poultry and stands of bees have been increased. This decrease in the number of live stock is probably associated with the high prices and comparatively large profits to be derived from the production and direct

sale of farm crops. The dairy and hog industries, especially, are attractive only when highly profitable and are subject to decline when satisfactory profits can be made from the direct sale of alfalfa and other feeds. The actual decline in the number of dairy cattle has been very slight, and there are indications that the best cows are being retained. This weeding out of the poorer animals may be expected to result in the development of superior dairy herds.

In Table III are compiled data concerning the number and value of live stock on the Newlands Reclamation Project in December, 1919, compared with similar data for the previous year. These figures are quoted from the annual report of the United States Reclamation Service. It will be noted that there has been an actual decrease in the value of live stock of all kinds amounting to \$24,790.

TABLE III.—*Number and estimated value of live stock on the Newlands Reclamation Project in 1918 and 1919.*

Item.	Inventory, Dec. 31 (number)—				Values in 1918.		Values in 1919.			
	1918	1919	1919							
			In-crease.	De-crease.	Unit.	Total.	Unit.	Total.	In-crease.	De-crease.
Horses	3,394	3,256	-----	138	\$79.25	\$268,990	\$80.40	\$261,785	-----	\$7,205
Mules.....	340	276	-----	64	76.47	26,090	74.05	20,440	-----	5,560
Cattle:										
Dairy.....	1,895	1,850	-----	45	91.71	173,785	99.61	184,285	\$10,500	-----
Other.....	8,839	6,778	-----	2,061	42.51	375,790	48.92	331,620	-----	44,170
Sheep.....	3,560	3,347	-----	213	10.80	38,464	10.34	34,612	-----	3,852
Hogs.....	3,343	3,048	-----	295	15.01	50,194	14.48	44,137	-----	6,057
Fowls:										
Turkeys.....	4,746	3,442	-----	1,304	3.15	14,928	3.94	13,563	-----	1,365
All other.....	20,220	25,932	-----	5,712	.92	18,538	.97	25,232	-----	6,694
Bees, hives.....	1,589	2,821	-----	1,232	13.23	21,029	16.73	47,254	-----	26,225
Total.....			-----			987,718		962,928	43,419	68,209
Net decrease.....			-----							24,790

WEATHER CONDITIONS.

Weather records are kept in cooperation with the United States Weather Bureau, the Biophysical Laboratory of the Bureau of Plant Industry, and the University of Nevada. In 1919 the frost-free period was 15 days longer than normal, the last killing frost in spring occurring May 6 and the first in autumn on September 22. A light frost occurred on the morning of June 1, which nipped the leaves of tender plants in low or exposed situations, but as very little damage was reported it was not classed as a killing frost. The mean temperature for the four summer months was somewhat higher than usual. The season was exceptionally favorable for the growth of alfalfa, fruit, and those products of the field and garden which thrive best in hot weather. Because of the long, hot growing season practically all varieties of corn were able to become thoroughly

matured. Irrigation water was plentiful, so there was no loss from water shortage. The total precipitation was 3.98 inches, which is 82 per cent of normal. The observations for the year 1919 and the average of all years since observations were begun are presented in Table IV.

TABLE IV.—*Summary of climatological observations at the Newlands Experiment Farm for the 14-year period from 1906 to 1919, inclusive.*

PRECIPITATION (INCHES).

Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 14 years ¹	0.80	0.47	0.40	0.56	0.45	0.34	0.20	0.16	0.40	0.35	0.25	0.49
For 1919.....	T.	.93	.35	.40	.36	.00	.09	.00	.73	.18	.20	.74

EVAPORATION (INCHES).

Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 12 years ²	1.21	1.80	4.15	6.21	8.27	10.00	10.86	9.75	6.61	3.92	2.05	0.94
For 1919.....	.577	1.624	4.00	6.30	9.41	10.43	11.60	10.07	7.23	3.84	1.597	.614

DAILY WIND VELOCITY (MILES PER HOUR).

Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 11 years ³	3.2	3.8	4.7	5.3	4.9	4.1	3.3	3.0	3.0	2.7	2.8	2.7
For 1919.....	1.3	3.8	4.6	4.3	3.1	2.6	2.0	1.6	2.3	2.2	2.0	1.9

ASPECT OF THE SKY (DAYS).

Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 14 years ⁴	13.1	13.0	17.8	17.9	17.8	22.5	23.1	24.9	22.3	23.1	17.9	14.5
Clear.....	9.5	7.7	7.7	7.4	9.1	4.4	5.2	3.9	4.0	3.1	6.0	7.0
Partly cloudy.....	8.4	7.5	5.5	4.7	4.1	3.1	2.7	2.2	3.7	4.8	6.1	9.5
Cloudy.....	24.0	8.0	12.0	10.0	16.0	26.0	28.0	26.0	21.0	21.0	20.0	16.0
For 1919:	4.0	10.0	9.0	13.0	13.0	4.0	2.0	5.0	6.0	6.0	8.0	8.0
Clear.....	3.0	10.0	10.0	7.0	2.0	.....	1.0	.....	3.0	4.0	2.0	7.0
Partly cloudy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cloudy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TEMPERATURE (°F.).

Year, etc.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average for 14 years: ⁵												
Absolute maximum.....	57.9	63.6	73.8	81.2	87.9	95.4	100.1	98.9	91.6	82.6	72.8	61.3
Daily maximum.....	42.9	49.4	58.7	66.7	72.4	83.3	92.9	91.0	80.2	67.6	55.5	44.2
Absolute minimum.....	- 0.6	7.4	16.2	20.6	28.1	36.1	44.1	41.0	30.2	19.9	9.2	3.4
Daily minimum.....	17.4	23.3	28.0	34.9	40.5	47.3	54.3	51.7	42.8	32.9	23.9	18.6
Monthly mean.....	30.0	36.2	43.3	50.7	56.4	65.3	73.5	71.5	61.4	50.3	39.7	31.3
14 year record:												
Highest recorded.....	70.0	72.0	79.0	89.0	102.0	101.0	105.0	103.0	95.0	89.0	81.0	72.0
Lowest recorded.....	-25.0	-12.0	9.0	13.0	21.0	31.0	38.0	36.0	26.0	13.0	- 1.0	- 4.0
For the year 1919:												
Absolute maximum.....	63.0	60.0	72.0	84.0	97.0	97.0	103.0	102.0	89.0	76.0	71.0	63.0
Mean maximum.....	44.6	46.8	56.5	68.5	81.0	86.8	96.6	94.1	80.6	60.6	52.3	41.0
Absolute minimum.....	- 4.0	13.0	11.0	19.0	30.0	31.0	45.0	42.0	33.0	13.0	.0	- 4.0
Mean minimum.....	13.6	26.7	27.7	34.8	45.3	45.0	55.6	52.0	40.8	28.5	19.2	16.4
Mean.....	29.1	36.8	42.0	51.7	63.2	65.9	76.1	73.0	60.7	44.6	35.8	28.7

¹ January, February, and March, 13 years.

² January and February, 9 years; March, 11 years.

³ January, February, March, April, and November, 10 years.

⁴ January, February, March, and October, 13 years.

⁵ March and October, 13 years.

TABLE IV.—*Summary of climatological observations at the Newlands Experiment Farm for the 14-year period from 1906 to 1919, inclusive—Continued.*

KILLING FROSTS.

Year.	Last in spring.		First in autumn.		Frost-free period (days).
	Date.	Day of year.	Date.	Day of year.	
1906.....	May 31	151	Oct. 4	277	126
1907.....	May 14	134	Sept. 19	262	126
1908.....	May 30	150	Sept. 25	268	118
1909.....	May 24	144	Sept. 22	265	121
1910.....	May 16	136	Sept. 23	256	120
1911.....	May 27	147	Sept. 18	261	114
1912.....	May 22	142	Sept. 25	268	126
1913.....	May 13	133	Sept. 23	266	133
1914.....	Apr. 24	114	Sept. 9	252	138
1915.....	May 20	140	Sept. 14	257	117
1916.....	June 1	152	Sept. 10	253	101
1917.....	May 21	141	Sept. 25	268	127
1918.....	May 29	149	Oct. 7	280	131
1919.....	May 6	126	Sept. 22	265	139
Average.....	May 20	140	Sept. 22	265	125

CHARACTER OF THE WORK IN PROGRESS.

In 1919 the work of the Newlands Experiment Farm, which is located about 1 mile south of the town of Fallon, Churchill County, Nev., consisted of (1) recording the weather conditions at the Experiment Farm, (2) variety tests of general farm crops, (3) variety tests of horticultural crops, (4) field experiments in the reclamation of alkali soil, and (5) laboratory work relating to local problems in crop production. In previous years from 30 to 50 acres were planted annually on private farms, consisting of varietal and horticultural tests of the farm crops of greatest economic value for this project. Because of a lack of funds this work and also the cooperative work with farmers in keeping temperature records was discontinued.

VARIETAL AND CULTURAL TESTS OF FIELD CROPS.

BARLEY VARIETY TESTS.

Six varieties of barley were planted on March 24 on plats H-14 and H-15. All varieties used were grown in the variety tests of the previous year. In all previous years the variety tests of barley have been conducted on private farms on plats that were seldom less than one-quarter acre in size, but in 1919 all cooperative work with farmers was abandoned and it was necessary to plant on small plats, each having an area of 0.074 acre. All varieties were planted in duplicate. The borders were planted to wheat, which was cut out with a scythe before the barley was ripe. A blank space of 2 feet was left between varieties. The varieties were harvested July 11 and thrashed July 23. It will be noted that the yields in 1919, as given in Table V, were very low, but the rank of the varieties is the same as for the previous year and varies but little from the 5-year average, which is also shown in the table.

TABLE V.—*Tests of six varieties of barley grown on the Newlands Experiment Farm in the 5-year period from 1915 to 1919, inclusive.*

Variety.	Results in 1919.						Summary for the 5-year period.							
	Rank.	Actual yield (pounds).			Yield per acre.		Yields per acre (pounds).					Average.		
		Series I.	Series II.	Average.	Pounds.	Bush-els.	1915	1916	1917	1918	1919	Pounds.	Bush-els.	
Coast.....	1	79.0	80.4	79.7	1,077	22.4	2,040	1,765	979	2,436	1,077	1,659	34.6	
Trebi.....	2	72.8	61.8	67.3	909	18.9	.....	.....	1,135	1,926	909	1,323	27.6
Chevalier.....	3	67.6	57.4	62.5	845	17.6	.....	1,504	833	1,726	845	1,227	25.6
Svanhals.....	4	71.1	48.1	59.6	805	16.8	1,435	1,408	842	1,672	805	1,232	25.7	
Hannchen.....	5	59.6	54.4	57.0	770	16.0	1,581	1,456	1,040	1,645	770	1,298	27.0	
Nepal.....	6	36.8	31.3	34.1	460	9.6	1,218	1,292	510	1,570	460	1,010	21.0	

WHEAT VARIETY TESTS.

Eight varieties of wheat were planted March 10 on plats H-1 and H-2. Each of these plats was subdivided into twelve smaller ones, each having an area of 0.022 acre. Plantings were made in triplicate. The borders were planted to barley, which was cut with a scythe before the wheat was ripe. Soon after the wheat was up, a sand storm cut the leaf blades back to the ground, and the crop was seriously damaged. The varieties were harvested July 18 and thrashed five days later.

It will be noted that there is a decided variation between the rank of the varieties in 1919 and the 5-year average, which may have resulted from the fact that the windstorm in early spring did not damage all of the subplats in an equal degree. Table VI presents the results of the 1919 experiment and the yield of all varieties except Early Baart for a period of five years. As noted in previous reports, Little Club is the most productive variety and should be planted when wheat for feeding purposes is desired, but it is not so desirable as hard wheat for milling purposes.

TABLE VI.—*Tests of varieties of wheat grown on the Newlands Experiment Farm in the 5-year period from 1915 to 1919, inclusive.*

Variety.	Results in 1919.							Summary for the 5-year period.							
	Rank.	Yield per plat (pounds).				Yield per acre.		Rank.	Yields per acre (bushels).						
		Series I.	Series II.	Series III.	Total.	Pounds.	Bushels.		1915	1916	1917	1918	1919	Total.	Average.
Bluestem.....	1	15.0	22.4	23.6	61.0	924	15.4	6	38.5	42.1	37.2	37.0	15.4	170.2	34.0
Little Club.....	2	14.1	24.1	21.0	59.2	897	15.0	1	45.5	52.2	50.8	47.1	15.0	210.6	42.1
Defiance.....	3	19.1	17.4	20.0	56.5	856	14.3	4	39.0	42.8	44.3	37.0	14.3	177.4	35.5
Dicklow.....	4	12.8	19.2	20.4	52.4	794	13.2	3	41.6	42.3	51.1	37.8	13.2	186.0	37.2
Sonora.....	5	9.4	18.7	21.8	49.9	756	12.6	5	40.5	37.2	46.2	35.4	12.6	171.9	34.4
Rieti.....	6	10.5	20.3	15.1	45.9	695	11.6	2	42.7	48.5	45.2	39.2	11.6	187.2	37.4
Early Baart.....	7	15.8	10.4	15.3	41.5	629	10.5	.....	.....	.....	.....	.....	10.5	.....	.....
Marquis.....	8	7.2	9.3	17.8	34.3	520	8.7	7	37.3	40.9	51.0	29.5	8.7	167.4	33.5

EXPERIMENTS WITH POTATOES.

The potato industry on the Newlands project suffered a marked decline in 1919, probably because of the increasing prevalence of *Fusarium* blight, which renders unmarketable a large percentage of the tubers. Only 152 acres were reported as having been planted in 1919. Unless means are found and adopted for effectually controlling this disease it will be impossible for the potato industry to reach a position of importance among the crops of the project.

OUTLINE OF THE EXPERIMENTS.

The potato experiments on the Newlands Experiment Farm included (1) tests of time of planting; (2) tests of distance of planting; (3) comparison of whole and cut seed, size of seed pieces, and size of seed tubers; (4) variety tests; (5) treatment of eelworm-infected seed.

The yields obtained during the season of 1919 were for some reason much lower than the average of former years. All the experiments except the variety test were either duplicated or triplicated.

TIME-OF-PLANTING TESTS.

Plantings were made for six consecutive weeks, beginning with April 15. This experiment has been conducted in a similar manner for a period of three years. In 1919 the test was carried on in duplicate, each row being 120 feet long. The yields reported (Table VII) are for marketable tubers only.

TABLE VII.—*Time-of-planting tests with potatoes on the Newlands Experiment Farm in 1917, 1918, and 1919.*

Time of planting.	Yields per 100-foot row (pounds).				Time of planting.	Yields per 100-foot row (pounds).			
	1917	1918	1919	Average.		1917	1918	1919	Average.
April 15 to April 19	84	94	32	70	May 6 to May 10	86	98	26	70
April 22 to April 26	99	124	35	86	May 13 to May 17	102	75	49	75
April 29 to May 3	111	86	31	76	May 20 to May 24	72	71	19	54

In 1919 the yield obtained from the planting made on May 13 was decidedly higher than the others. In the two tests of previous years the highest yields were obtained from plantings made about the first of May. To judge from the results of the three years, it seems that it is safe to plant potatoes from the middle of April to the middle of May, but plantings made after the latter date are likely to be less productive.

DISTANCE-OF-PLANTING TESTS.

In this experiment seed pieces were dropped in the row at distances of 6, 12, 18, and 24 inches. The average yields per 100 feet of row are given in Table VIII. There is a gradual decline in total production as the distance of planting is increased, but when the market-

able tubers are considered it is seen that the distance of planting does not so materially affect the result. There is a tendency for the culls to increase with the closer planting. The indications are that the usual planting distance of 18 inches is approximately correct.

TABLE VIII.—*Distance-of-planting tests with potatoes on the Newlands Experiment Farm in 1919.*

Distance of planting in row.	Yields per 100-foot row (pounds).		
	Market-able.	Culls.	Total.
6 inches.....	81	33	114
12 inches.....	72	28	100
18 inches.....	81	17	98
24 inches.....	65	20	85

PREPARATION OF SEED TESTS.

This experiment was conducted for the purpose of comparing the use of whole, halved, and quartered seed and of tubers of different sizes on the yield of the resulting crop. In comparing whole, halved, and quartered seed, tubers for seed as nearly uniform in size as possible were selected. Plantings were made in triplicate. The average yield of usable potatoes and the percentage of stand obtained are shown in Table IX.

In this experiment the whole seed produced better than the cut seed and the halved seed better than the quartered. In an experiment of this character, where unequal quantities of seed are used according to the size of the seed pieces, it is necessary to calculate the net yield by subtracting the weight of the seed planted from the actual yield. The net yields per 100-foot row are shown in the last column of the table.

TABLE IX.—*Preparation of seed tests with potatoes on the Newlands Experiment Farm in 1919.*

Character of seed used.	Stand (per cent).	Results per 100-foot row (pounds).		
		Seed used.	Yields.	
			Gross.	Net.
Tubers nearly uniform in size:				
Whole seed.....	91	14	89	75
Cut seed—				
Halved.....	90	7	63	56
Quartered.....	89	4	57	53
Tubers of different sizes:				
Large—				
Whole.....	67	31	46	15
Cut.....	66	7	46	39
Medium—				
Whole.....	72	13	37	24
Cut.....	74	5	20	15
Small—				
Whole.....	79	7	27	20
Cut.....	72	3	22	19

In that part of these experiments wherein the size of the seed tubers was taken into consideration, the potatoes were graded into large, medium, and small. By small tubers is meant those weighing less than 4 ounces; medium tubers, those weighing from 4 to 8 ounces; and large tubers those weighing more than 8 ounces. Whole and cut seed of the three grades was prepared and planted in triplicate. The results are shown in Table IX.

The planting of whole seed of large potatoes does not appear to be advisable, because of the greater quantity of seed used. Large potatoes cut produced a decidedly higher net yield than either medium or small seed either whole or cut.

Whole seed of medium-sized potatoes returned a slightly larger net yield than either medium or small seed cut and also a larger yield than from the small potatoes planted whole. It appears that the use of small seed is not so profitable as the use of larger seed.

POTATO VARIETY TESTS.

Ten varieties of potatoes were grown on the experiment farm in 1919. There was considerable difference in the relative yields or rank of the varieties for this year and for the two previous years. In 1919 the Irish Cobbler gave the highest returns, although during a period of five years the average yield of this variety was the lowest of seven on trial.

The details of the variety test for 1919 are given in Table X, which also includes a summary of the average yields and rank of seven varieties for five years. The Burbank, as a rule, appears to be the highest yielding variety, but it has the disadvantage of producing more second growth than any of the others.

TABLE X.—*Variety tests of potatoes on the Newlands Experiment Farm for the 6-year period from 1914 to 1919, inclusive.*

Variety.	Results in 1919.				Summary for the 6-year period.							
	Yields per 100-foot row (pounds).			Stand (per cent).	Rank.	Yields per 100-foot row (pounds).						
	Market-able.	Culls.	Total.			1914	1915	1916	1917	1918	1919	Average.
Irish Cobbler.....	63	12	75	85	7	25	26	27	65	133	63	56
Early Freeman.....	52	7	58	68	6	41	21	43	91	106	52	59
Producer.....	55	11	66	88								
Burbank.....	55	11	66	91	1	30	50	40	147	154	55	79
American Wonder.....	50	16	66	82	3		50	44	99	96	50	68
Earliest of All.....	45	9	54	72	2	61	51	26	140	108	45	72
Colorado Pearl.....	46	7	53	80	4	27	43	45	120	116	46	66
Netted Burbank.....	34	6	40	57								
Blue Victor.....	25	6	31	70	5	36	25	33		186	25	61
Scotch Rose.....	17	7	24	68								

TREATMENT OF EELWORM-INFECTED SEED.

The experiment with seed potatoes infected with eelworms was conducted according to the plan followed in 1918. Potatoes heavily infected with eelworms were selected for seed and given treatment by heat for varying lengths of time and at different temperatures. The plantings were made in duplicate, and noninfected potatoes were planted every third row. These check rows were used as a measure of the productiveness of the land area between any two rows, and the yields of the infected seed were calculated in percentages of the yields of the two nearest check rows. The soil was not uniformly productive, and this method increases the accuracy of the results over what they would be without the use of the check rows.

It appears that treatments of 30° C. for 24 hours and possibly of 35° C. for 12 hours were beneficial and resulted in a better stand and higher yield. In general, it may be considered that prolonging the heat treatment or increasing the temperature to more than 40° C. has the effect of reducing the yield.

EFFECT OF THE TREATMENT OF SEED POTATOES INFECTED WITH EELWORMS UPON THE INFECTION OF RESULTING CROPS.

In Table XI the results of the eelworm count of the crop grown from infected seed which had been given various treatments are given in detail. In counting, the potatoes were divided into four classes according to the degree of infection: (1) No infection, (2) light, (3) medium, and (4) heavy infection. In order to make it possible to compare the efficiency of one treatment with another they were scored so that a single number represented the relative infection. The scoring is performed by deducting from 100 per cent for each 1 per cent infection as follows: Heavy infection, 1 per cent; medium infection, two-thirds of 1 per cent; light infection, one-third of 1 per cent; no infection, no deduction.

It is interesting to note that there was a light infection even in the check rows in which seed free from eelworms was used. The average score of the check rows was 95 per cent. It is not known whether this infection resulted from eelworms originally in the soil, or in the seed used, or from migrations of eelworms from the rows adjoining where infected seed was used. A measure of the efficiency of the treatments is obtained by comparing the scores of the infested rows with the scores of the nearest check rows. In the last column of Table XI it is seen that the infection was greater than that in the check rows for the following treatments: Untreated, 30° C. for 24 hours, 35° C. for 12 hours, 35° C. for 24 hours, and 45° C. for 12 hours. All the remainder of the treatments appeared to be 100 per cent efficient in so far as eelworm infection was concerned.

TABLE XI.—Effect of the treatment of seed potatoes infected with eelworms upon the infection of the resulting crop at the Newlands Experiment Farm in 1919.

Treatment of seed (tem- perature data in ° C.).	Number tubers, counted.	Potatoes infected.								Score.	Score of adjoining check rows	
		Number.				Per cent.					Average.	Deviation of treated rows.
		None.	Light.	Medium.	Heavy.	None.	Light.	Medium.	Heavy.			
Check.....	200	158	40	1	1	79.0	20	0.5	0.5	92½	.....
Untreated.....	200	116	65	14	5	58.0	32.5	7.0	2.5	82	93	-11
Held at 30° for 24 hours.....	200	128	49	11	12	64.0	24.5	5.5	6.0	82	95	-13
Check.....	200	179	19	1	1	89.5	9.5	.5	.5	96	.....
Held at 35° for 12 hours.....	200	122	64	11	3	61	32	5.5	1.5	84	96	-12
Held at 35° for 24 hours.....	200	133	59	8	0	66.5	29.5	4.0	0	87½	95	-7½
Check.....	200	170	29	1	0	85.0	14.5	.5	0	95	.....
Held at 35° for 48 hours.....	117	110	6	1	0	94.0	5.0	0	0	98	95	+ 3
Held at 40° for 6 hours.....	200	178	21	1	0	89.0	10.5	.5	0	96	96	+ 1
Check.....	200	171	28	1	0	85.5	14.0	.5	0	95	95	+ 3
Held at 40° for 12 hours.....	172	163	9	0	0	95.0	5.0	0	0	98	95	+ 2
Held at 40° for 24 hours.....	182	165	17	0	0	91.0	9.0	0	0	97	95	+ 3
Check.....	200	170	28	2	0	85.0	14.0	1.0	0	95	95	+ 2
Held at 40° for 36 hours.....	145	129	12	4	0	89.0	8.0	3.0	0	95	95	0
Held at 45° for 6 hours.....	121	105	15	1	0	87.0	12.0	1.0	0	95	94	+ 1
Check.....	200	166	33	1	0	83.0	16.5	.5	0	94	94	- 2
Held at 45° for 12 hours.....	58	46	10	2	0	79.5	17.0	3.5	0	92	94	- 2

TESTS OF HORTICULTURAL CROPS.

EFFECT OF ACID PHOSPHATE ON TOMATOES.

For the experiment to show the effect of acid phosphate 20 plants of Earliana tomatoes were set in each of 15 rows. The yields of the two border rows were determined, but not considered in estimating the results of this experiment. In the remaining 13 rows, alternate rows were used as checks and received no treatment. The remaining rows were treated with acid phosphate, as shown in Table XII. The fertilizer was weighed and applied by mixing it with the earth around each plant.

It will be noted that only a small percentage of the plants matured tomatoes. The loss was due to Fusarium blight, which was prevalent and caused greater losses in tomatoes in 1919 than in any previous year. The loss was greater among the fertilized plants than among those in the check rows, the average loss being 51 per cent in the check rows and 61 per cent in the fertilized rows.

The total yield of the six fertilized rows was 370 pounds, or 62 pounds per row, and the yield of the seven check rows was 474 pounds, or 68 pounds per row. This reduction in yield by the addition of the acid phosphate was the result of the increased loss of plants by disease rather than an actual lessening of the yield, for the average yield per plant of the fertilized rows was 7.9 pounds and of the check rows 6.9 pounds. It is probable, therefore, that the addition of acid phosphate would be found beneficial during seasons when Fusarium blight is not prevalent. This one experiment is not, of course, suffi-

cient to prove that there is a relationship between the addition of the phosphate and the loss of the plants by *Fusarium* blight.

TABLE XII.—*Effect of the application of acid phosphate on the growth and yield of tomatoes at the Newlands Experiment Farm in 1919.*

Row.	Treatment.	Number of plants.		Loss of plants (per cent).	Yield (pounds).	
		Set.	Maturing.		Total.	Per plant.
No. 1.....	Border.....	20	4	80	42	10.5
No. 2.....	Check.....	20	5	75	59	10.9
No. 3.....	Phosphate, 1 ounce per plant.....	20	6	70	73	12.2
No. 4.....	Check.....	20	10	50	121	12.1
No. 5.....	Phosphate, 2 ounces per plant.....	20	7	65	75	10.4
No. 6.....	Check.....	20	10	50	97	9.7
No. 7.....	Phosphate, 3 ounces per plant.....	20	7	65	83	11.8
No. 8.....	Check.....	20	11	45	70	6.4
No. 9.....	Phosphate, 1 ounce per plant.....	20	8	60	62	7.8
No. 10.....	Check.....	20	11	45	52	4.7
No. 11.....	Phosphate, 2 ounces per plant.....	20	9	55	39	4.3
No. 12.....	Check.....	20	12	40	34	2.8
No. 13.....	Phosphate, 3 ounces per plant.....	20	10	50	38	3.8
No. 14.....	Check.....	20	10	50	41	4.1
No. 15.....	Border.....	20	18	10	61	3.4

SWEET-CORN VARIETY TESTS.

Seven varieties of sweet corn were tested on the experiment farm in 1919. They were planted in duplicate by hand. The results are shown in Table XIII.

TABLE XIII.—*Yields of sweet-corn varieties on the Newlands Experiment Farm in 1919.*

Rank.	Variety.	Yield (pounds).			Total length of rows (feet).	Weight per 100-foot row (pounds).
		Row I.	Row II.	Total.		
1	Black Mexican.....	95	93	188	539	35
2	Early Sugar.....	105	81	186	539	34.5
3	Peep o' Day.....	54	99	153	539	28.4
4	Country Gentlemen.....	98	35	133	539	24.7
5	Golden Bantam.....	79	38	117	479	24.4
6	Columbus Market.....	33	52	85	539	15.8
7	Narrow-Grained Evergreen.....	22	37	59	539	11.0

The Black Mexican variety leads in production, with Early Sugar a close second. Narrow-Grained Evergreen gave the smallest yields per 100 feet of row. The ranks of the varieties differ somewhat from the previous year. In 1918 the Country Gentlemen gave the largest yields, with the Black Mexican second. On account of its dark color the Black Mexican does not look as pleasing as the other varieties, especially when canned.

BLOSSOMING DATES OF FRUIT VARIETIES.

During the 4-year period, 1916–1919, inclusive, blossoming records have been kept of all trees in field A–4. It is interesting to note the great variation from year to year in the dates of the first opening of the buds. The average date of the opening of the first blossoms of the apple trees in the orchard have been as follows: 1916, 19 trees,

April 17; 1917, 21 trees, May 7; 1918, 21 trees, April 29; 1919, 19 trees, April 23. (Table XIV.)

The trees are in full bloom from five to nine days after the first blossoms appear.

TABLE XIV.—*Blossoming dates of fruit-tree varieties on the Newlands Experiment Farm during the 4-year period, 1916 to 1919, inclusive.*

Row, tree number, and kind.	Variety.	Buds first open.			
		1916	1917	1918	1919
Row I:					
1 (apple).....	Arkansas Black.....	Apr. 17	May 7	Apr. 30	Apr. 25
2 (apple).....	Ben Davis.....	Apr. 20	do.....	Apr. 29	Apr. 23
3 (apple).....	Akin.....	Apr. 17	do.....	Apr. 30	Do.
4 (apple).....	Ralls.....	Apr. 22	May 12	May 5	Do.
5 (apple).....	Sierra.....	Apr. 20	May 7	Apr. 30	Apr. 22
6 (apple).....	Shackleford.....	do.....	do.....	do.....	Apr. 23
7 (apple).....	Babbitt.....	Apr. 14	do.....	Apr. 26	Apr. 22
8 (apple).....	Banana.....	Apr. 20	do.....	Apr. 28	Do.
Row II:					
1 (apple).....	Coos.....	Apr. 18	do.....	Apr. 30	Apr. 25
2 (apple).....	Opalescent.....	Apr. 20	May 10	May 1	Do.
3 (apple).....	Yellow Bellflower.....	Apr. 13	do.....	Apr. 27	Do.
4 (apple).....	Gano.....	Apr. 20	do.....	Apr. 28	Do.
5 (apple).....	Red Astrachan.....	Apr. 13	May 4	Apr. 26	Apr. 23
6 (apple).....	Golden Sweet.....	Apr. 18	May 7	May 1	Apr. 24
7 (apple).....	Mann.....	do.....	May 1	do.....	Apr. 23
8 (crab).....	Hyslop.....	Apr. 13	do.....	Apr. 28	Do.
Row III:					
2 (apple).....	Wisner.....	Apr. 14	May 5	do.....	Apr. 25
4 (apple).....	Waxen.....	Apr. 13	May 6	Apr. 29	Apr. 23
Row IV:					
1 (crab).....	Transcendent.....	do.....	Apr. 30	Apr. 19	Do.
2 (apple).....	Winter Banana.....	do.....	May 10	Apr. 30	Apr. 12
3 (apple).....	Haas.....	Apr. 30	do.....	May 2	Apr. 25
Row V:					
1 (pear).....	Barry.....	do.....	Apr. 25	Apr. 20	Apr. 18
2 (pear).....	Kieffer.....	do.....	Apr. 30	Apr. 15	Apr. 14
3 (pear).....	Worden.....	do.....	do.....	Apr. 20	Apr. 16
Row VI:					
1 (pear).....	Easter Beurre.....	do.....	Apr. 13	Apr. 18	Apr. 18
2 (plum).....	Chimax.....	do.....	Apr. 20	Apr. 17	Do.
3 (prune).....	Sugar.....	do.....	Apr. 26	do.....	Apr. 16

VARIETIES OF FRUIT TREES TO PLANT.

Many inquiries come in each year, chiefly from new settlers, asking for information in regard to the varieties of fruit trees best adapted to this region. The varieties mentioned in the lists below are generally known to be successfully grown on the Newlands project. Undoubtedly many other desirable varieties will be added in the next few years. No attempt is made to present a complete list of desirable varieties, but it is intended to name those which are known to be successful. Mr. C. G. Swingle has kindly assisted by furnishing a list of varieties producing most satisfactorily on his ranch. Those shown in black-faced type are recommended for first choice.

APPLES.

Summer varieties.—**Yellow Transparent**, **Red June**, **Red Astrachan**, **Maiden Blush**, **Early Harvest**.

Fall and early-winter varieties.—**Wagener**, **Wealthy**, **Early Melon**, **McIntosh Red**.

Winter varieties.—**Black Ben**, **Gano**, **Delicious**, **Jonathan**, **King David**, **Banana**, **Yellow Bellflower**, **Grimes (Grimes Golden)**, **Winesap**.

APRICOTS.

Apricots are not recommended for extensive planting, as they are frequently caught by the late spring frosts.

CHERRIES.

Some of the common sour varieties fruit nearly every season, but the sweet cherries are less reliable bearers. Of the sour varieties, plant Early Richmond, Montmorency, and May Duke. Some growers will wish to plant some of the large sweet varieties for the pleasure of having them during favorable seasons. For this purpose Black Tartarian, Napoleon (*Royal Anne*), and Bing are suggested.

PEARS.

The Bartlett pear is an excellent variety, but is subject to blight. The Kieffer is productive, but the quality is not so good as the Bartlett. Other varieties suggested are Duchess, Flemish Beauty, Seckel, and Winter Nelis.

PEACHES.

Peaches are not reliable bearers in this climate, but during favorable seasons they bear heavily and produce fruit of excellent flavor. Desirable varieties are **Crawford Late**, **Illinois**, **Elberta**, Mayflower, Early Wheeler (*Red Bird Cling*), Muir, and Phillips Cling.

PLUMS.

Plums are quite regular bearers, and a fair crop can be expected from some varieties in most seasons. Few varieties have been tested, and the following recommendations may therefore be materially changed within the next few years: **Omaha**, American, Blue Damson, Compass Cherry.

GRAPES.

Grapes are grown successfully on the bench lands and on the heavier soils of the Island and Stillwater districts. On some of the lighter soils away from the river they have not been so satisfactory. **Concord**, **Diamond**, and **Worden** are recommended.

EXPERIMENTS IN THE RECLAMATION OF ALKALI SOIL.

EFFECT OF MANURE ON CROP YIELDS.

This experiment was begun in 1917 and has for its object the determination of the effect of manure added biennially upon the reclamation of the alkali soil of field E. The crops used are wheat, fodder corn, and mangels.

TABLE XV.—*Effect of manure on yields of crops growing on alkali soil on the Newlands Experiment Farm in 1919.*

Crop and plat number.	Year manured.	Unit of yield.	Yield per acre.	Percentage of increase.
Silage corn:				
No. 1.....	1917 and 1919.....	Ton.....	3.96.....	1.8
No. 2.....	Not manured.....	do.....	3.89.....	
Wheat:				
No. 3.....	1918.....	Bushel.....	19.3.....	6.1
No. 4.....	Not manured.....	do.....	18.2.....	
No. 5.....	do.....	do.....	8.9.....	6.7
No. 6.....	1917 and 1918.....	do.....	9.5.....	6.7
Mangels:				
No. 7.....	Not manured.....		No crop.....	
No. 8.....	do.....		do.....	

In 1918 greatly increased yields were obtained from the plats which had been manured. In 1919 there was also an increase in production resulting from the manuring, but it was not so great as in 1918. The results in detail for the year 1919 are shown in Table XV. Wheat yields were increased 6.1 and 6.7 per cent and corn yields 1.8 per cent.

ALKALI RECLAMATION EXPERIMENTS IN FIELD Y.

In 1914 various treatments were given to a series of 18 plats in field Y. This field was very alkaline over the greater part of the area. In past reports it has been shown that the treatments given had the effect of materially increasing the yield of alfalfa. In the fall of 1918 nine of the checks were plowed and the treatments of



FIG. 1.—Applying gypsum by means of the manure spreader. This apparatus is very satisfactory for this purpose. Sufficient manure is put in the bottom of the spreader to carry the gypsum.

gypsum and manure that had been given in 1914 were repeated (fig. 1). In the spring of 1919 these nine plats were seeded to barley. The results are compiled in Table XVI.

It will be noted that there was an increased yield of 80 per cent for the first treatment, a decrease of 1 per cent for the second treatment (this decrease being due to an unusually bad area in plat 4), and an increase of 17 per cent for the third treatment.

The remaining nine plats in field Y, plats 10 to 18, inclusive, were allowed to remain in alfalfa in 1919. In this case, as in all previous experiments reported, there was a decided increase in yield as a result of the treatments (Table XVI). Because of the extremely spotted character of the soil, one would not be justified in drawing conclusions as to the relative efficiency of the treatments used, but there can be no doubt that gypsum on this type of soil is decidedly beneficial.

The treatments so far given, however, have not raised the yield to the point of profitable production.

TABLE XVI.—*Alkali reclamation experiment in growing barley and alfalfa on field Y of the Newlands Experiment Farm in 1919.*

Crop and plat number.	Treatment.	Yields in 1919.			
		Per acre (pounds).	Treated plats.		
			Average (pounds).	Increase over adjacent check plats.	
				Pounds.	Per cent.
Barley:					
No. 1.....	Tile, gypsum, manure.....	302	441	197	80
No. 2.....	Check.....	244			
No. 3.....	Tile, gypsum, manure.....	580			
No. 4.....	Tile, gypsum, manure.....	394	628	—6	—1
No. 5.....	Check.....	634			
No. 6.....	Tile, gypsum, manure.....	854			
No. 7.....	Gypsum, manure.....	1,235	1,225	175	17
No. 8.....	Check.....	1,050			
No. 9.....	Gypsum, manure.....	1,215			
Alfalfa:					
No. 10.....	Gypsum.....	4,233	3,078	2,845	1,220
No. 11.....	Check.....	233			
No. 12.....	Gypsum.....	1,922			
No. 13.....	Tile, gypsum, manure, sweet clover...	1,167	1,173	366	45
No. 14.....	Check.....	807			
No. 15.....	Tile, gypsum, manure, sweet clover...	1,178			
No. 16.....	Sulphuric acid.....	1,100	1,050	1,050	.....
No. 17.....	Check.....	0			
No. 18.....	Sulphuric acid.....	1,000			

ALKALI RECLAMATION EXPERIMENTS IN FIELD B.

The alkali reclamation experiments were located in plats 9 and 10 of field B, where the soil is of such a nature that seeds germinate with difficulty and the plants which do emerge grow to a height of only a few inches during the season. After each irrigation the surface of the untreated soil cements over, forming a hard crust.

The two large plats, B-9 and B-10, were each divided into 20 small plats, each having an area of 12 by 45 feet, or 0.0124 of an acre. After the treatments were made, each plat was plowed and harrowed separately. Wheat was seeded in all plats with a grain drill. When the grain was mature it was cut by hand, put into sacks, and allowed to dry in the air, after which it was weighed on delicate balances. The weights given include both grain and straw. The details of this experiment are given in Table XVII, the rank of each treatment according to actual yields being shown in the right-hand column.

Manure had a decidedly beneficial effect wherever used. (Figs. 2 and 3.) When used in combination with sulphur, gypsum, or acid phosphate, the yields were generally greater than when manure was

used alone. Chemicals, alone or in combination, improved the soil to some extent, but they were not usually so effective as the manure. Manure applied at the rate of 2,800 pounds per plat did not appear to be so effective as when used in smaller quantities.

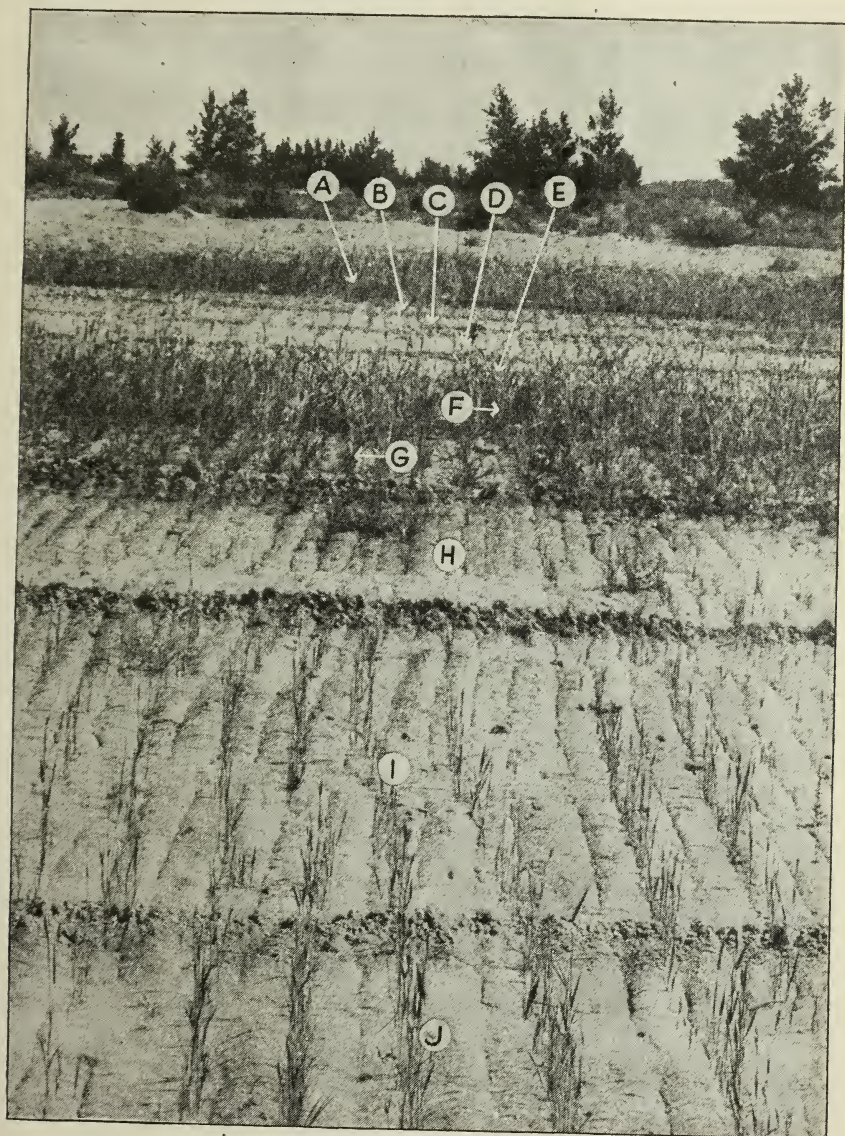


FIG. 2.—Results of alkali-reclamation experiments on plat B-9. Note the beneficial effect of manure wherever used. Gypsum, acid phosphate, and sulphur were only beneficial. Key to treatments: A, Manure; B, phosphate and gypsum; C, phosphate and sulphur; D, check; E, phosphate; F, phosphate, gypsum, and manure; G, phosphate, sulphur, and manure; H, check; I and J, gypsum.

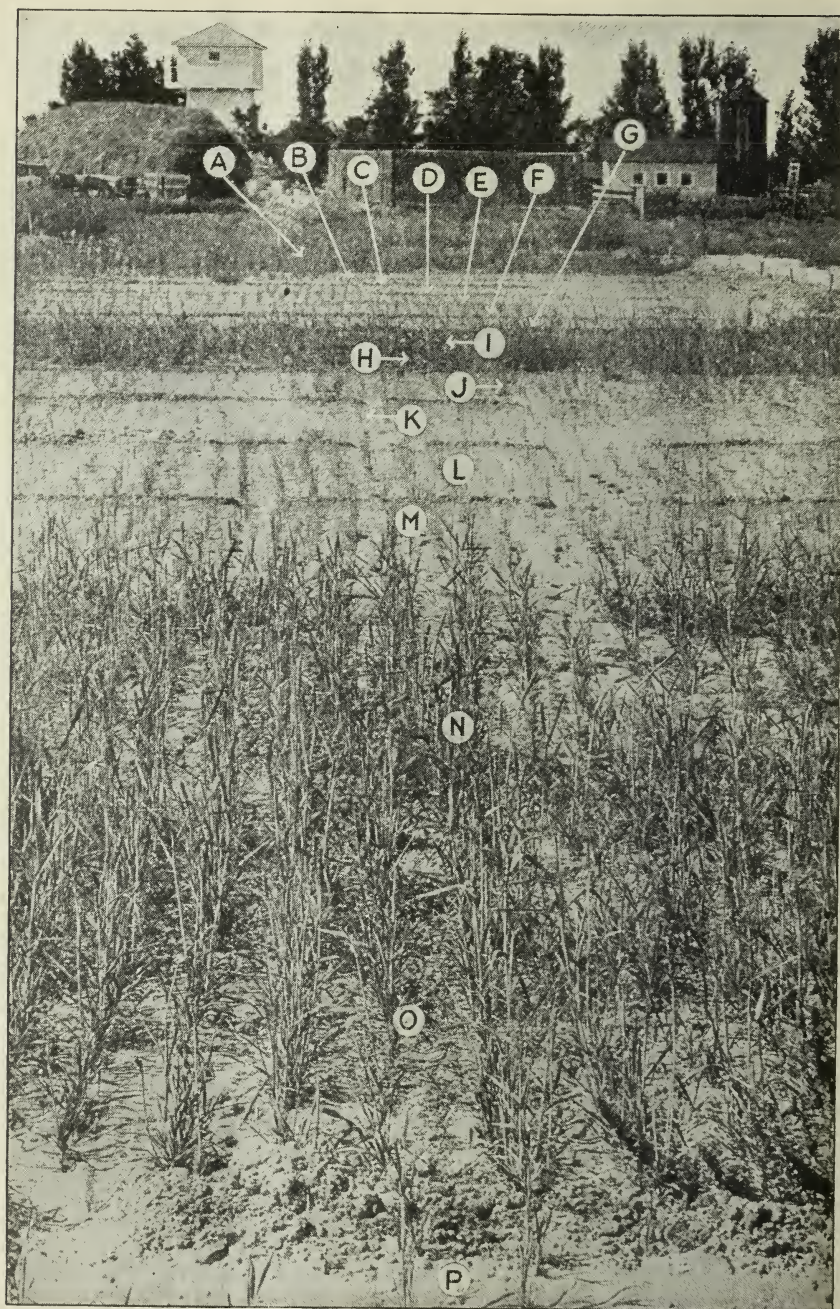


FIG. 3.—Results of alkali-reclamation experiments on plat B-10. Note the beneficial effect of manure wherever used. Gypsum, acid phosphate, and sulphur were only slightly beneficial. Key to treatments A, Manure; B, check; C and D, sulphur; E and F, gypsum; G, check; H, phosphate, sulphur, and manure; I, phosphate, gypsum, and manure; J, phosphate; K, check; L, phosphate and sulphur; M, phosphate and gypsum; N, manure and phosphate; O, manure and sulphur; P, check.

TABLE XVII.—*Effect of various soil treatments on the growth of wheat in field B of the Newlands Experiment Farm in 1919.*

[The average yield of 9 check plats was 0.46 pound.]

Plat, subdivision, and treatment.	Yield (pounds).			Rank.
	Series I.	Series II.	Total.	
Plat B-9:				
Check.....	0.31	0.25	0.56	.....
Gypsum 110 pounds.....	.44	.38	.82	12
Gypsum 28 pounds.....	.38	.25	.63	14
Sulphur 28 pounds.....	.31	.25	.56	15
Sulphur 7 pounds.....	.38	.44	.82	13
Check.....	0	.38	.38	.....
Manure 700 pounds.....	.75	3.06	3.81	6
Manure 1,400 pounds.....	.44	3.38	3.82	5
Manure 2,800 pounds.....	.94	2.06	3.00	10
Manure 1,400 pounds, gypsum 28 pounds.....	3.00	3.13	6.13	2
Check.....	1.25	1.00	2.25	.....
Plat B-10:				
Check.....	1.25	.25	1.50	.....
Manure 1,400 pounds, sulphur 14 pounds.....	4.56	3.44	8.00	1
Manure 1,400 pounds, acid phosphate 4 pounds.....	2.75	2.25	5.00	3
Gypsum 28 pounds, acid phosphate 4 pounds.....	2.88	.56	3.44	7
Sulphur 14 pounds, acid phosphate 4 pounds.....	2.75	.50	3.25	9
Check.....	.56	.13	.69	.....
Acid phosphate 4 pounds.....	1.25	.50	1.75	11
Acid phosphate 4 pounds, gypsum 28 pounds, manure 1,400 pounds.....	1.81	2.44	4.25	4
Acid phosphate 4 pounds, sulphur 14 pounds, manure 1,400 pounds.....	1.00	2.38	3.38	8
Check.....	a4.31	.25	.25	.....

^a This figure is not used in computing the average, as part of the plat contained good soil.

The toxicity of the soil in these plats was due to the presence of a small quantity of sodium carbonate. Other alkali salts were present in quantities too small to prove toxic. A soil sample was taken in the center of each plat before any manure or chemical had been added. The average amount of alkali salts present in the 40 samples thus obtained is shown in Table XVIII.

TABLE XVIII.—*Alkali salts present in the soil in the alkali reclamation experiment in field B of the Newlands Experiment Farm before treatment in 1919.*

Salt.	Plat B-9.		Plat B-10.	
	1 foot.	2 feet.	1 foot.	2 feet.
Na ₂ CO ₃	0.072	0.050	0.065	0.054
NaHCO ₃80	.081	.072	.077
NaCl.....	.012	.010	.012	.009
Na ₂ SO ₄	0	0	0	0

B

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THE FEDERAL BUREAU OF CHEMISTRY.

GROWTH.

The Bureau of Chemistry of the United States Department of Agriculture has grown from a small division, organized in 1862, with a staff of four or five men, to a bureau employing more than 300 chemists, bacteriologists, microscopists, engineers, and inspectors, granted an annual appropriation of over \$1,250,000 for the enforcement of the Food and Drugs Act and the Tea Act and for research work of practical value to the country.

FUNCTION.

The function of the Bureau of Chemistry is twofold. In the first place it enforces the provisions of the Food and Drugs Act, popularly known as the "Pure Food Law," passed in 1906, and of the Tea Act. At the same time it conducts investigations arising in connection with its regulatory or law-enforcement work, and continues to serve the purpose for which it was originally established, the study of chemical problems pertaining to agriculture, as well as those of the industries utilizing agricultural products.

ORGANIZATION.

At the head of the organization are the Chief and the Assistant Chief of the Bureau, who are responsible for the administration of the Food and Drugs Act and the Tea Act, and exercise general supervision over the research work. Twenty-four laboratories and three offices in Washington develop facts upon which the decisions and policies of the Bureau are based, recommend methods for attacking regulatory problems, and conduct scientific investigations.

For administrative purposes in the enforcement of the Food and Drugs Act, the country has been divided (fig. 2) into three inspection districts—the Eastern, with headquarters in New York, the Central, with headquarters in Chicago, and the Western, with headquarters in San Francisco. These districts are further subdivided into inspection territories, with a station, provided with a force of chemists and inspectors, at an important trade center and port of entry within each territory, as shown in the map (fig. 2). While the work of the stations is for the most part regulatory, some time is devoted to the solution of research problems which come to the attention of the chemists in the course of their enforcement of the law.

REGULATORY WORK.

By far the greater part of the activities and funds of the Bureau are devoted to the enforcement of the Food and Drugs Act. This act forbids the importation, the shipment in interstate or foreign commerce, or the manufacture and sale in any Territory or the District of Columbia of adulterated or misbranded foods or drugs.¹ Thus it serves to protect the public health from injurious foods and the public pocketbook from falsely or fraudulently labeled foods and drugs, and to promote fair trade by guarding the honest manufacturer against unfair competition with misbranded or spurious articles sold under the guise of higher-priced commodities.

DOMESTIC FOODS.

In the law, the term "food" is not confined to those products which are commonly recognized as food for mankind, but includes also beverages (such as soft drinks and mineral water), confectionery, condiments, feeds for horses, cattle, and poultry, and substances like baking powder which enter into the preparation of foods. Nor

¹ The text of the Food and Drugs Act, and the rules and regulations for its enforcement, are printed in Circular 21, Office of the Secretary, U. S. Department of Agriculture.

does the law restrict the application of the term "adulterated" to foods containing an added poisonous or deleterious substance, such as milk preserved with formaldehyde, which might prove harmful to the consumer. Within the law, "adulterated" has a far wider significance, being applied as well to the following kinds of foodstuffs: (1) Those which are made wholly or in part from filthy or decomposed material, as in the case of catsup made from rotten tomatoes, or milk containing an excessive number of bacteria; (2) those which have been cheapened by the substitution in whole or in part of some less valuable material or one possessing no food value whatsoever, such as an article sold as coffee in which the coffee has been replaced wholly or partially by chicory, or cottonseed meal containing an excessive amount of cottonseed hulls; (3) those of an inferior grade made to simulate goods of better quality, for example, acetic acid which has been colored to look like cider vinegar; and (4) those from which certain valuable component parts have been removed, as skim milk offered for sale as whole milk.

Under the Federal Food and Drugs Act many cases are brought against manufacturers and shippers who violate the misbranding clauses of the law. Misbranding of food, which may be defined as the use of an untruthful or misleading label, includes the sin of omission as well as the sin of commission. Labeling a bottle of cottonseed oil "Olive Oil" is a typical sin of commission, while the manufacturer who fails to declare the weight of food in package form is guilty of the sin of omission. Shading from one of these types of violation to the other are many forms of misbranding.

Often labels are worded in strict accordance with the acts, but have the type so arranged or pictorial representations so employed that the purchaser receives an entirely erroneous impression as to the contents of the package. Deceptive labeling of this kind is considered to be in violation of the act.

Another all too common deception against the consuming public is food of short weight sold in package form. Prints of butter weighing from 14 to 15 ounces, but bearing no statement to indicate that they fall short of one pound, are representative of this type of fraud. The Bureau protects the purchaser against such practices by enforcing that section of the law which provides that a food shall be judged misbranded, "if in package form, the quantity of the contents be not plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count."

DOMESTIC DRUGS.

To secure the desired effect, it is imperative that all drugs used or prescribed by a physician shall be what he has every right to expect them to be, judging by their labels. If they are under or over the accepted standards, the Food and Drugs Act demands that their labels shall so specify.

In addition, the Food and Drugs Act covers medicines that are advertised and sold directly to the general public, the so-called "patent medicines." Under the law the presence in a preparation, and the amount in which they occur, of certain dangerous or habit-forming substances, enumerated in the act, must be made known upon the label. With this information at hand, the purchaser, of course, may exercise his own discretion in administering the product.

It is the duty of the Bureau of Chemistry also to see that labels on "patent medicines" hold out to the public no promise of benefit that is not fully justified by the composition of the preparation. As a standard for the determination of such questions, the Bureau has adopted the general consensus of opinion among the medical profession as to the usefulness and limitations of the various drugs. The labeling of medicinal preparations is judged not by the presence or absence of such terms as "remedy," "cure," and "treatment," but by the names of diseases and the impression conveyed by the wording to the average purchaser.

IMPORTED FOODS AND DRUGS.

Many food products, medicinal herbs, which for one reason or another can not be grown profitably in this country, and "patent medicines" are constantly being offered for importation into the United States. These are denied entry if they fail to conform to the general requirements of the Food and Drugs Act, are not in accord with the laws of the country of origin, or are otherwise dangerous to the health of the people of the United States. When circumstances warrant, relabeling or reconditioning of the goods may be allowed. If thereby a product meeting the requirements of the act is obtained, the goods are then permitted entry. The field stations maintained by the Bureau at certain ports of entry, as New York, Boston, New Orleans, and San Francisco (fig. 2), examine and analyze samples of shipments offered for entry into the United States which are suspected of being in violation of the Food and Drugs Act.

PROCEDURE.

Anyone found guilty, after trial in the Federal courts, of violating the provisions of the Food and Drugs Act, or who pleads guilty to such an offense, is subject to a fine, and, under certain circumstances, to imprisonment. The evidence necessary to prove a producer or shipper guilty is gathered and presented at the trial by the Bureau of Chemistry, through the Department of Justice. Sometimes the cooperation of State and city health, food, drug, and feeding stuffs officials is enlisted. Figure 1 shows each essential step in the development of a case as it progresses through the organization units of the Bureau of Chemistry and the Office of the Solicitor of the Department of Agriculture, the Department of Justice, and the courts.

An inspector of the Bureau (1) collects samples of a product suspected of being in violation of the act, and forwards them to the proper station for analysis. At the station an analysis is made (2) the results of which are sent by the station chief, with his recommendation as to the

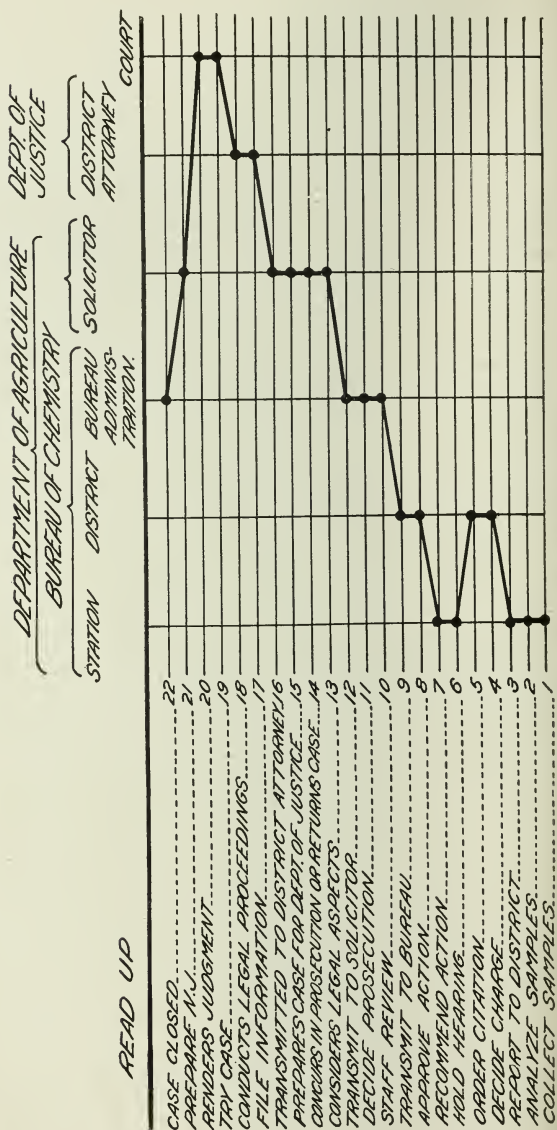


Fig. 1.—Course of a case under the Food and Drugs Act.

proper action to be adopted, to his district chief (3). If the district chief approves the station's recommendation (4), he instructs the station (5) to cite the manufacturer or shipper of the product in question to a hearing at the station headquarters, and at the same time submits a statement of the action taken to the chief of the Bureau in Washington. On the date set, the person cited reports for an oral hearing (6), or presents in writing his statement as to why the Government should not take further action.

After the hearing, the station chief prepares a summary of the findings which he forwards to the district chief, together with his recommendation as to the proper action to be taken (7). The district chief may indorse the recommendation as it stands or modify it (8), after which he sends all the papers in the case, accompanied by a statement of what he considers appropriate action, to the chief of the Bureau. The chief or assistant chief of the Bureau may then decide upon the next step, or may refer the matter (10) to the laboratory or office in Washington specializing in the product involved. If the specialist agrees with the recommendation of the district chief that prosecution proceedings should be instituted, the case is transmitted to the chief or assistant chief of the Bureau, with an indorsement of the recommendation for prosecution.

The case is then considered in the office of the chief and assistant chief (11), after which, if these officials concur in the recommendation made, it is sent to the Solicitor of the Department of Agriculture (12) to be examined as to its legal aspects. The Solicitor decides (13) who is liable in connection with the alleged violation, and determines whether or not the evidence at hand is sufficient to support prosecution. If he disagrees with the recommendation of the Bureau, he returns the papers to the Bureau for further consideration. If, however, he concurs in the Bureau's recommendation for prosecution (14), by authority of the Secretary of Agriculture, he prepares the papers necessary to be transmitted to the Department of Justice (15), where the case is next sent (16) for final transmittal to the district attorney who will try the case.

The district attorney (17) files the information or presents the case to the grand jury for indictment of the producer or shipper, and conducts the necessary legal proceedings (18). The court hears the case (19), with or without a jury, and renders judgment (20), imposing a sentence where the verdict is "guilty." Members of the Bureau of Chemistry often are summoned to serve as witnesses at such trials. After the termination of the case in court, a notice of judgment, giving the essential facts, is prepared

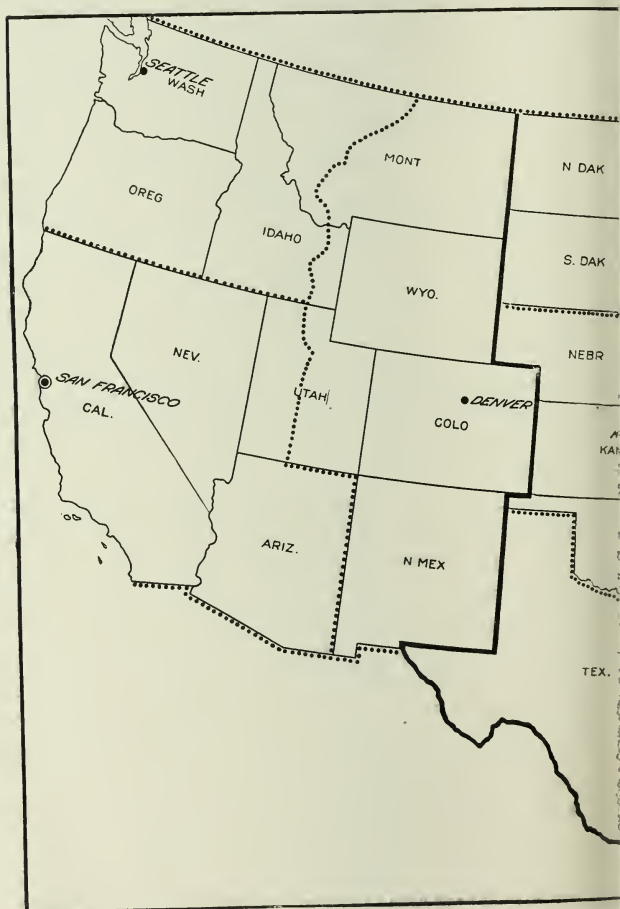
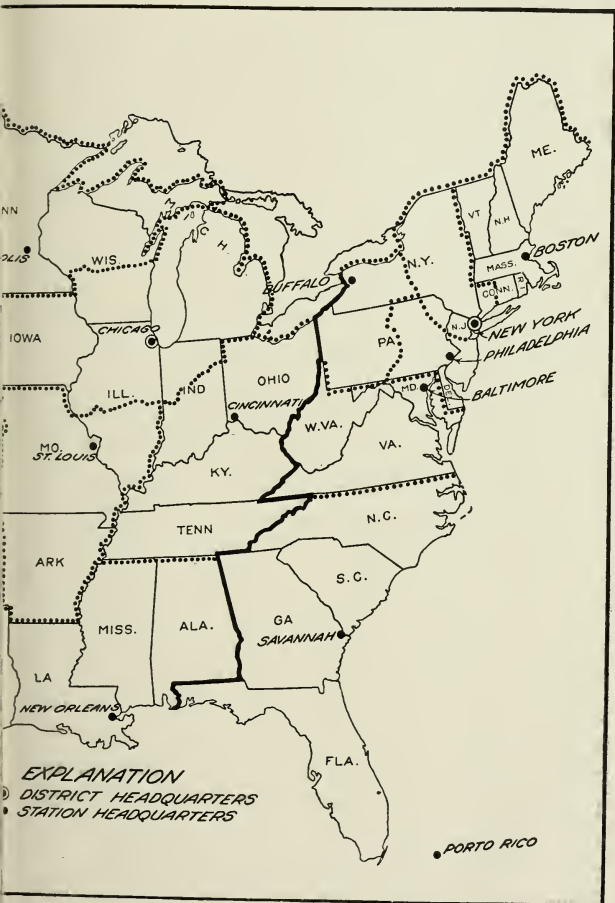


Fig. 2.—Food and drug insp

by the Solicitor (21), and later published by the Bureau. This terminates the case, and the records are closed (22).

Two forms of legal action may be instituted in the correction of violations of the Food and Drugs Act involving the shipment of domestic products. Sometimes a criminal prosecution is brought against the alleged offender. Again, goods which are being shipped contrary to the provisions of the law are seized under order of the court and removed from the channels of trade until a decision



as to what disposition should be made of them has been reached by the court. The Bureau officials base their decisions as to the type of action to be instituted upon the conditions connected with each case.

The procedure in connection with the enforcement of that section of the law relating to foods and drugs offered for importation into this country does not involve court action. The officials of the Division of Customs, of the Treasury Department, cooperate in this phase of the Bureau's regulatory work.

All foreign merchants are required to certify to certain facts concerning the foods and drugs which they desire to ship, before the proper United States consular officials. These certificates are attached to the invoices of the various products, and the Bureau of Chemistry inspectors are allowed to scrutinize all invoices of foods and drugs coming into this country. If an examination of the invoices and their accompanying certificates indicates that an article does not comply with the terms of the law, samples of it are taken for analysis, the entire shipment being held until the results of the examination are known. When goods are found to be in violation of the act, the importer is so informed, and an opportunity is given him to present to the Government his evidence as to why his product should not be denied entry. If the results of the hearing fail to convince the Bureau that the goods are in compliance with the law, a report is submitted to the collector of customs at the port of entry, who then refuses to admit the product in question into this country. If the importer is not satisfied with the action of the Bureau he may appeal to the Secretary of Agriculture. When, however, the case proves to be one of misbranding only, the articles usually may be brought in after the labels have been corrected. Another exception is made in the case of importers who, through no fault of their own, receive shipments of foods or drugs which are adulterated or misbranded, but not grossly. It is customary to release such goods after they have been relabeled, sorted, and cleaned, or denatured, provided an

article which fulfills the requirements of the law can thus be obtained. This privilege, of course, is not extended to persons who have abused it in the past or have requested it repeatedly.

COOPERATION WITH STATES AND CITIES.

Under the provisions of the Food and Drugs Act, the Bureau of Chemistry can exercise supervision only over foods and drugs entering interstate or foreign commerce, or made, sold, or offered for sale in the District of Columbia or the Territories of the United States. It has no power over those products which are made and sold within the confines of a single State. Most of the States, however, have food and drug laws similar in many respects to the Federal act, and designed to afford the same protection to the several States as the Federal act does to the nation at large. It is most desirable that the State and Federal officials charged with the enforcement of public health laws work together in harmony. To that end, the office of cooperation in the Bureau of Chemistry keeps the State food, drug, and feeding stuffs officials informed on matters pertaining to the administration of food and drug laws, both State and Federal, and provides a practical and effective system of cooperation among such officials. In this way the Bureau keeps in touch with 50 departments, including those in practically every State of the Union, the District of Columbia, Hawaii, Porto Rico, and the Philippine Islands. It provides them with information on matters of general interest relating to the administration of the Federal Food and Drugs Act, and secures their opinions on important questions under consideration by the Bureau in connection with the enforcement of the law.

FACTORY INSPECTION.

An increasingly important part of the Bureau of Chemistry's regulatory work is its factory inspection. So far as its limited force of inspectors will permit, the Bureau endeavors to conduct a systematic investigation of plants

where foods and drugs shipped in interstate commerce are made. As a result of such work, it frequently becomes possible for the Government, through its technical staff, to offer various manufacturers constructive advice which

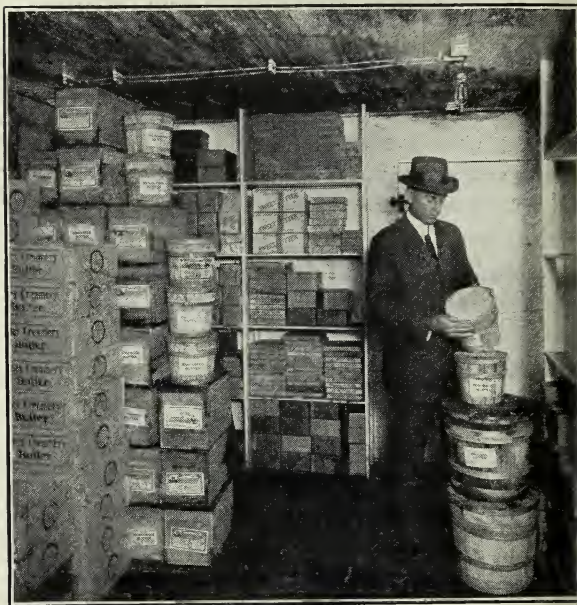


Fig. 3 —Food and drug inspector examining butter.

will enable them to remedy defects in their processes, thus improving the quality of their output and the efficiency of their operations, as well as bringing their goods into compliance with the law.

TEA INSPECTION.

In 1920, the Tea Inspection Service, formerly part of the United States Treasury Department, was transferred to the Department of Agriculture, upon the joint recommendation of the Secretary of the Treasury and the Secretary of Agriculture. As no duty is imposed on tea, and as the Bureau of Chemistry, under the Food and Drugs Act, is charged with the examination of all

imported foods and drugs, it was thought that the tea inspection work was more closely related to the Department of Agriculture than to the Treasury Department.

Tea is subject to the provisions of both the Food and Drugs Act and the Tea Inspection Act. While the Food and Drugs Act covers only adulteration or misbranding, the Tea Act provides for a physical standard of quality as well as purity.

The act to prevent the importation of impure or unwholesome tea, commonly known as the Tea Act, which was passed by Congress in 1897, and later amended, provides that the Secretary of Agriculture shall appoint each year a board of seven tea experts who shall select standards for tea. Such standards are distributed among the officials enforcing the law, and may be bought at cost by the tea trade and others interested.

It is the duty of the Supervising Tea Examiner, stationed in Washington, with the assistance of seven tea examiners and their assistants, stationed in various ports of entry, to see to it that no tea which falls below the standards fixed by the Secretary is permitted entry into the United States.

The importer of any tea which is rejected is given 30 days in which to appeal his case to the United States Board of Tea Appeals, composed of three employees of the Department of Agriculture, stationed in the city of New York. If the tea is rejected for quality, the Board of Tea Appeals summons witnesses from the trade, while if it is rejected for impurities the chemist's report, upon which the rejection was originally based, usually is accepted. No appeal may be made from the decision of the Board of Tea Appeals.

The law allows the importer six months in which to remove his rejected tea from this country. If not outside the limits of the United States by that time, it must be destroyed.

Tea waste, tea siftings, tea sweepings, and low-grade tea may be brought into the United States if they are to be used solely for technical manufacturing purposes.

The importer of such products, however, must give bond to the collector of customs that their identity will be destroyed in the process of manufacture.

RESEARCH WORK.

FOOD AND DRUG ANALYSIS.

To ascertain accurately when a food or drug is adulterated or misbranded, it is, of course, necessary to have suitable standards for comparison. Before the analyst can pass intelligently upon the samples submitted to him for examination, he must know the true composition of the articles which they purport to be. Consequently, a large part of the scientific force of the Bureau of Chemistry is engaged in the investigation of many natural products. Based upon the results thus obtained, the Department formulates definite standards for the guidance of the food and drug officials of the country and the manufacturers.

To illustrate, it was found that spices were being grossly adulterated and misbranded, and that it was difficult to determine when to prosecute cases involving such products. Accordingly, all the spices in common use have been studied physically, chemically, and microscopically. Using the results of this study as a foundation, fair standards for spices have been determined and published to serve as a basis for action in the enforcement of the law.

Such standards are published in Office of the Secretary Circular 136. New and tentative standards and informal opinions are made public through the Service and Regulatory Announcements of the Bureau.

INVESTIGATION OF COMMERCIAL METHODS.

To supplement this first type of research work, investigations are undertaken to perfect various processes used in the preparation of foods and drugs and to devise methods for the utilization of by-products hitherto wasted.

Much has been accomplished along this line in connection with the preparation of poultry and eggs for the market and their handling during storage and transportation. The results obtained have fully justified the Bureau's belief that some changes in methods and a careful attention to detail would add to the producer's profits, at the same time augmenting the country's food supply.

Extended studies also have been conducted to determine how certain fish, such as the sardine, might be packed to best advantage, and the by-products of the canneries salvaged.

Of great economic importance to the American fruit grower is the Bureau's project for working out ways to manufacture salable articles from the cull grapefruit, oranges, and lemons which too often constitute a total loss. To bring this about, methods are being devised whereby such culls may be converted into beverages, jam, marmalade, etc., for which a ready market exists.

INVESTIGATIONS IN AGRICULTURAL CHEMISTRY.

Along with the research work which is done in connection with the enforcement of the Food and Drugs Act go the investigations in the realm of agricultural chemistry that constituted the sole original function of the Bureau. The needs of the farmer still occupy an important place in this branch of the Federal service.

For example, the chemistry of plant growth is considered for the purpose of determining the effect of recognized plant food constituents and of the inorganic elements applied at different stages of the growth, as well as the effect of light, on the composition and physical characteristics of plants. The changes taking place during the growing period as the result of any particular treatment are investigated also.

The tanning of leather in its various aspects is studied, that the farmer may receive satisfactory instructions for preparing hides and for selecting with discrimination and intelligently caring for the leather which he uses for

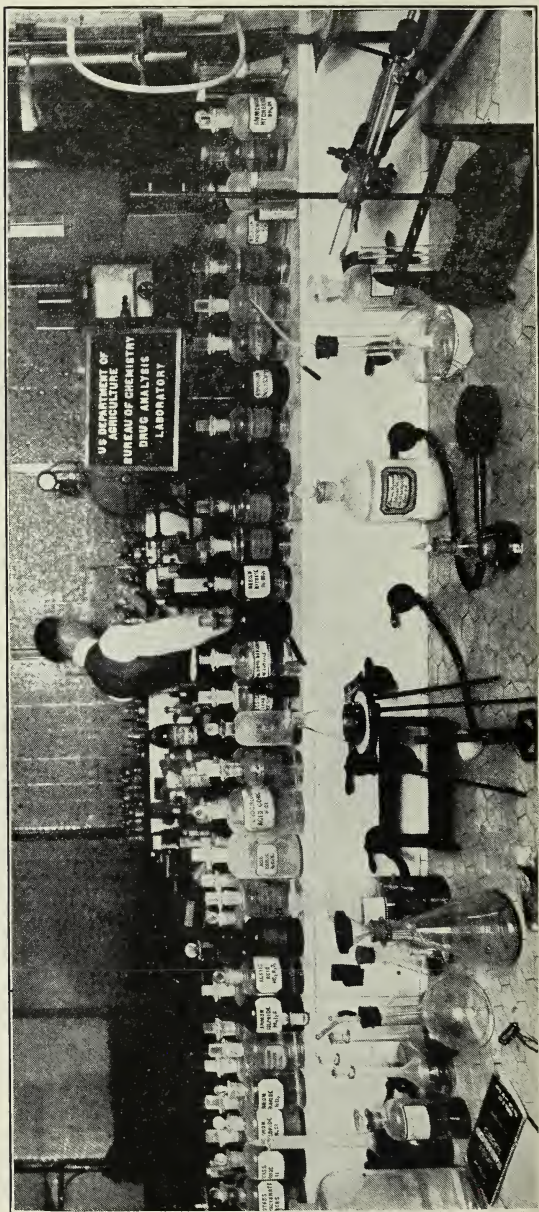


Fig. 4.—One of the laboratories of the Bureau of Chemistry in Washington.

boots, harness, or belting. Instructions for the cheap and effective waterproofing and mildewproofing of fabrics for wagon covers, stack covers, tents, and tarpaulins have been published.

Under way also is a scheme for showing the farmer how he may utilize as stock food cull potatoes and other waste products of his land. It is thought that certain plants not now so employed may prove valuable as stock food. A study of the proteins which they contain is being made to see whether this can be done.

As soon as it became evident that fires and explosions in thrashers and in grain elevators and mills might be due to the accumulation, under certain conditions, of grain dusts, the Bureau launched its grain-dust-explosion-prevention campaign for the benefit of the farmer, the thrasher, and the miller. The causes of such fires and explosions have been studied and the results made public. Preventive devices have been perfected and tested, and owners and operators of thrashing machines, mills, and grain elevators told how to install devices and adopt simple precautionary measures which should go a long way toward safeguarding their property.

COLLABORATION WITH OTHER DEPARTMENTS.

Because of the Bureau's fitness, in the matter of both personnel and equipment, for conducting chemical, microscopical, and microbiological examinations, many of the other Government departments and bureaus have acquired the habit of turning over to it certain parts of various problems coming within their jurisdiction.

For example, the Post Office Department submits for analysis samples of drugs, cosmetics, depilatories, "fat producers," "fat reducers," food suspected of containing poisons, and other material going through the United States mails which is believed to be fraudulent or harmful. The Treasury Department enlists the aid of the Bureau of Chemistry in devising currency paper which is difficult to counterfeit and at the same time is as

serviceable as possible. Many samples of foodstuffs and other supplies for the Army are submitted by the office of the Quartermaster General of the Department of War for analysis by the Bureau.

Added to these duties are the working out of new analytical methods and the perfecting of old ones, upon which the Bureau is constantly engaged. These results are published from time to time, that they may be of service to commercial and Government chemists alike.

COLOR INVESTIGATIONS.

Color research work was begun many years ago in the Bureau of Chemistry, for the reason that various types of dye materials are agricultural products and also because the largest users of dyes are the industries utilizing raw agricultural materials. Moreover, the Bureau has been called upon to study very extensively the artificial (coal-tar) dyes, on account of their wide use to color food products.

When, therefore, shortly after the outbreak of the recent Great War, Congress thought it advisable for the Government to assist in the development of a domestic dye industry, the experience thus gained by the Bureau of Chemistry made it particularly well equipped to undertake the work.

The color laboratory considers chiefly the fundamental principles that underlie the mechanism of the reactions which enter into the production of dyes, and determines the chemical and physical constants of the materials used in the industry. The factory chemist rarely has time to devote to this type of work, and, when he is in a position to carry it on, keeps secret the results which he obtains. The findings of the Government, on the other hand, are made public as rapidly as possible, for the advancement of the entire American dye industry.

OFFICE OF DEVELOPMENT WORK.

The practical application in the industries and in the arts of the results of scientific research is quite apart from the actual carrying out of an investigation. That the industrial world may have the full benefit of all such results obtained in the Bureau of Chemistry, an office has been established to serve as the connecting link between the Government and the manufacturer or other interested person. This office, known as the Office of Development Work, assumes charge of the results of any given fundamental project of the Bureau as soon as it reaches the stage where it gives promise of being ready for industrial development. The Office of Development Work, of course, handles only discoveries made in the Bureau of Chemistry.

PUBLICATIONS.

Reports of the results of the Bureau's work are issued from time to time. Some take the form of Department of Agriculture bulletins or circulars, a list of which may be had on application to the Bureau, while others, which, it is believed, will be of interest chiefly to some particular class of readers or to a certain industry, appear in the scientific and trade journals of the country.

IN THE OPEN

THE NATIONAL FORESTS OF WASHINGTON



AT WHATCOM PASS—WASHINGTON NATIONAL FOREST

WELCOME
TO
THE NATIONAL FORESTS



SPIRIT LAKE—COLUMBIA NATIONAL FOREST

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

DEPARTMENT CIRCULAR 138

Contribution from the Forest Service

W. B. GREELEY, *Forester.*

DIRECTORY OF NATIONAL FORESTS IN WASHINGTON.

GEORGE H. CECIL, District Forester

District Office, Post Office Building, Portland, Oreg.

NATIONAL FOREST.	FOREST SUPERVISOR.	HEADQUARTERS.
Chelan	{ P. T. Harris	Okanogan, Wash.
	{ G. E. Mitchell	Chelan, Wash.
Columbia	F. H. Brundage *	Portland, Oreg.
Colville	C. C. Reid	Republic, Wash.
Okanogan	P. T. Harris	Okanogan, Wash.
Olympic	{ Rudo L. Fromme*	} Olympia, Wash.
	{ O. F. Erickson	
Rainier	G. F. Allen	Tacoma, Wash.
Snoqualmie	{ W. G. Weigle *	} Seattle, Wash.
	{ Lewis A. Treen	
Washington	C. H. Park	Bellingham, Wash.
Wenaha	J. C. Kuhns	Pendleton, Oreg.
Wenatchee	A. H. Sylvester	Wenatchee, Oreg.

* District Forest Inspector.

IN THE OPEN

THE NATIONAL FORESTS OF WASHINGTON

THE woods, rivers, and lakes, the alpine meadows, snow fields, and lofty peaks of the National Forests in Washington are an invitation and a challenge to the lover of the outdoors. Fish in the waters, big game in the back country, snow-covered peaks and glaciers at the top of the divides, and fine scenery everywhere, offer sport in abundance to the angler, the hunter, the mountain climber, the tourist, the hiker, and the camper—to everyone, in fact, who likes to take his recreation in the open.

The National Forests are the refuge of most of the remaining big game of the State. Deer, bear, cougar, cats, and coyotes are found on practically all the Forests. There are elk on the Olympic and Rainier and mountain goats along the Cascade Range, on the Washington, Chelan, Snoqualmie, Wenatchee, Rainier, and Columbia National Forests. Grouse are common on all the Forests, and in a few instances duck hunting is possible.

For the merciful hunter who shoots his game with the camera there is no closed season on any of these animals or birds. This to many is the ideal method of hunting, since the pictures of wild life thus obtained are evidences of great skill and cunning, and call up memories of happy days in camp and on the trail.

For those who hunt to kill, the State game laws, which are operative inside as well as outside the National Forests, regulate the amount of game that may be taken and the season when it may be hunted; and it is one of the duties of every Forest officer to cooperate with the State and county officials in seeing that these laws are observed, to the end that the game resources of the State may be preserved through wise use.

Well-located and carefully constructed highways, built in accordance with a definite road program, make it easy for automobiles to reach any of the National Forests of the State, and even to penetrate deeply into the wilderness. And beyond the roads many a trail leads high up to ridge and summit overlooking a tremendous expanse of magnificent scenery.

As fast as funds are available, National Forest roads and trails are being posted with signs to guide the visitor. These signs are of wood, painted white or cream with lettering in dark green or black and they bear in addition to the lettering a shield, in the middle of which is a pine tree and the letters "U S" with the words "Forest Service" above and "Department of Agriculture" beneath it. This shield is a reproduction of the badge worn by all rangers and other Forest officers, by which they may be identified.

Roads, trails, signboards, and maps make it easy to get about the Forest without any other guide. More than 4,000 miles of trail are kept open on the National Forests of Washington and are available for public use. Sixteen hundred miles of telephone lines make quick communication with the outside world possible. In an emergency, the Forest traveler can call up his family or office in town from some ranger station in the heart of the wilderness. Registers are kept at local Forest headquarters, where the visitor may write his name and indicate his probable route of travel. This will make it possible for a Forest officer to find him in case of the receipt of important messages.

The Forest Service has begun the development of camp and picnic grounds on suitable sites along the roads leading through the National Forests, clearing up camping grounds, and providing safe places for building camp fires and other simple conveniences. Forage for saddle animals and firewood are free.

There is something about life in the open that appeals strongly to the seeker after health and recreation. Even a few days spent out in Nature's wide space takes the mind from the vexatious daily problems and gives a broader outlook on life and its possibilities. Forests, streams, and mountains furnish a rugged companionship never known in town. The establishment of the National Forest secures for the people widespread areas on which no "Keep Out" signs prevent enjoyment of the natural attractions. These Forests belong to the people and those who use them are simply reaping the benefits of ownership. Millions are making use of their Forests every year—touring and tramping through them by road and trail, exploring their mountain fastnesses, and eagerly searching out their hidden nooks and canyons. You will find them camped by the quiet lakes and beside the singing streams and booming waterfalls. They are wearing trails to the lonely summits, where the most inspiring views may be obtained. And there is none to

warn them to keep off. Signs put up by the Forest Service guide them along the trails, and the Forest rangers they meet are familiar with the region and are glad to be of service to visitors. They direct them to the best places to fish, camp, hunt, hike, or take pictures, and ask in return only cooperation in preventing forest fires and in keeping camp grounds sanitary and attractive.

Maps and detailed information on any particular National Forest may be had on application to the District Forester, Post Office Building, Portland, Oreg., or to the supervisor of any Forest.

If you wish to build a permanent summer home you may lease a site for a term of years at a reasonable annual rental. A permit to occupy such a site may cost as little as \$5 a year, and seldom more than \$25. Your summer home may be a cabin, cottage, or something more pretentious, as you wish. The only restrictions are that the building must not be unsightly, and that the grounds must be kept in a neat and sanitary condition.

The use of the National Forests for recreation and health by larger numbers of people each year increases the danger of forest fires; this liability will become an asset just as soon as each individual Forest visitor is careful with his own fire and keeps on the lookout for fires left by others.

CAMPERS HELP PROTECT THE FOREST

THE service performed each year by tourists and campers in finding and putting out small fires before they have time to spread, reporting fires which they can not control, and giving voluntary help in fighting larger fires can not be estimated.

Still more effective service will be rendered when each Forest visitor personally uses the greatest caution in locating, building, and putting out camp fires. Lookers may help by carefully putting out stubs and being absolutely sure each patch is out before throwing it down.

Most persons who visit the Forests are careful in their use of fire; but a small proportion are not careful, and about one-third of the total number of fires on the National Forests originate from their inexperience or carelessness. Observance of the following rules will reduce the number of forest fires materially and save annually Forest resources worth millions of dollars.

SEVEN TESTED RULES FOR PREVENTING FOREST FIRES

1. MATCHES.—Be sure your match is out. Put it in your pocket or break it in two before throwing it away. Make this a habit.

2. TOBACCO.—Throw pipe ashes and cigar or cigarette stubs in the dust of the road, and stamp or pinch out the fire before leaving them. Do not throw them into brush, leaves, or needles.

3. LOCATION OF CAMP.—Select a spot as free as possible from inflammable material, sheltered from the wind, and near accessible water.

4. CAMP FIRES.—Never build a camp fire against a tree or log, in leaf mold, or in rotten wood. Build all fires away from overhanging branches and on a dirt or rock foundation. Dig out all rotten wood or leaf mold from the fire pit, and scrape away all inflammable material within a radius of from 3 to 5 feet. Make sure the fire can not spread on or under the ground or up the moss or bark of a tree while you are in camp, and that it is going to be easy to put out when you are ready to leave.

5. LEAVING CAMP.—Never leave a camp fire, even for a short time, without *completely extinguishing every spark* with water or fresh dirt free from moss and leaf mold. Do not throw charred logs to one side where a smoldering spark might catch. It is well to soak thoroughly all embers and charred pieces of wood and then cover them with dirt. Feel around the outer edge of the fire pit to make sure no fire is smoldering in charred roots or leaf mold. Hundreds of fires escape each year after campers have thought they were extinguished.

6. TRY TO PUT OUT ANY FIRE THAT YOU FIND.—If you can not put it out, get word to the nearest Forest officer as quickly as possible. Every minute saved in reaching the fire is of vital importance.

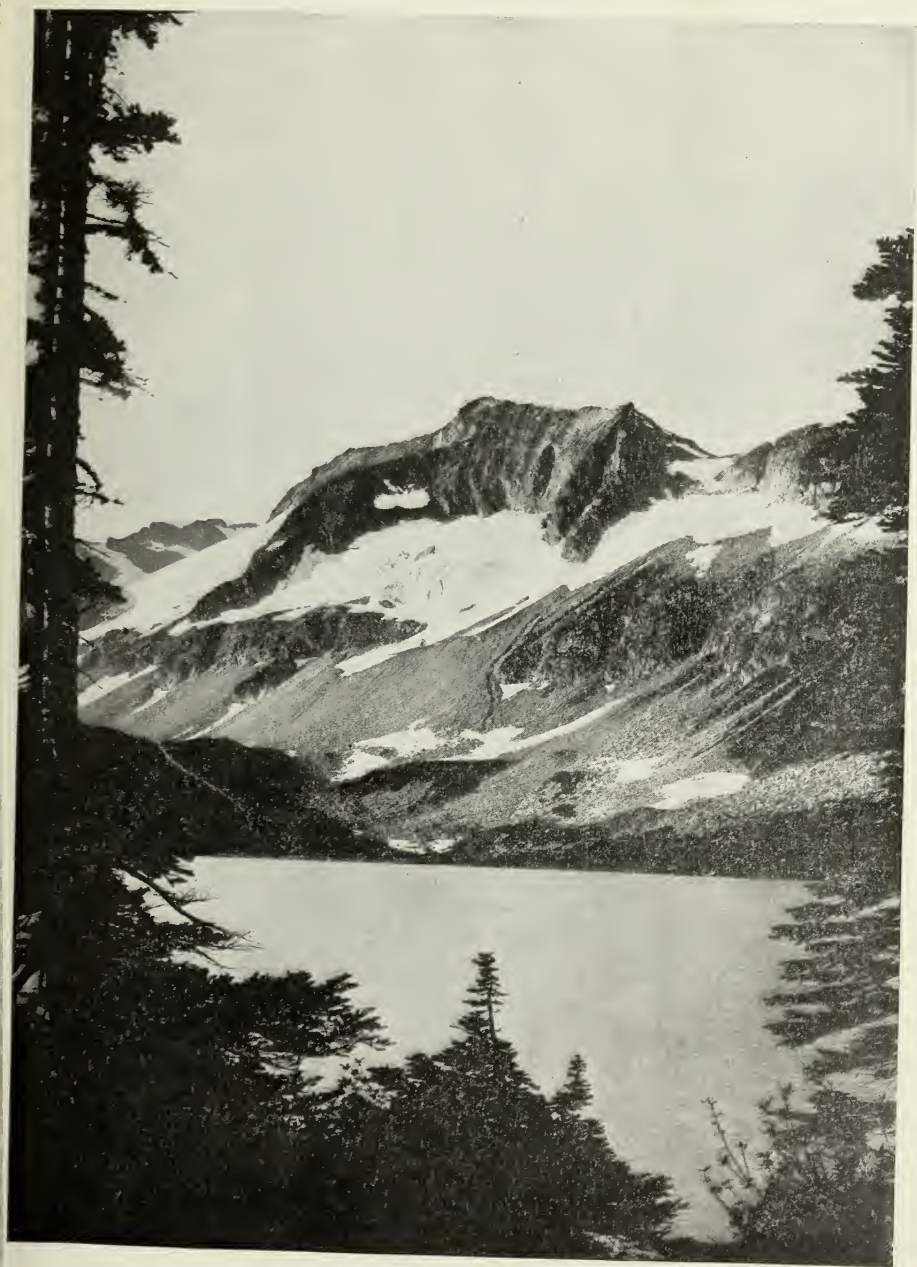
7. HELP ENFORCE THE FIRE LAWS.—They were made to protect your interests.

CHELAN NATIONAL FOREST

THE Chelan National Forest, with famous Lake Chelan, lies in north-central Washington, on the watershed of the Chelan and Entiat Rivers, which flow southeasterly into the Columbia. Lovers of wild mountain scenery visit this Forest by thousands every year. Of Lake Chelan a landscape engineer has written:

If one had the wildest fjord of Norway brought inland and filled with sweet and quiet waters or if one had Lake Brienz of Switzerland extended to a length of 50 miles, one would have a possible competitor for Lake Chelan; but until such improvements in terrestrial topography can be made this lake is unique. It is, in short, and without exaggeration or qualification, one of the best landscapes in the world.

Lake Chelan occupies 49 miles of an ancient glacial valley, and the Stehekin River flows into it, passing through a continuation of the same valley for about 20 miles. The Cascade, Sawtooth, and Chelan Ranges, which surround the lake, rise to



Lyman Lake Hanging Glacier—Chelan National Forest



Agnes Creek trail—Chelan National Forest

a general elevation of 8,000 feet, with many peaks higher. The level of the lake is 1,079 feet above the sea. The valley is from 10 to 18 miles in width. The combination of these features results in a canyon narrower than the Grand Canyon of the Colorado, and nearly a mile and a half deep. The rugged granite mountains have been carved by the ice into bold cliffs and peaks.

The bottom of Lake Chelan is in places more than 500 feet below sea level, and the water is cold, which perhaps accounts for the game qualities of its fish—steelhead, cutthroat, rainbow, and lake trout, and a good many Dolly Vardens. Fishing in the lake is best in June and July, the time when fly fishing in the smaller streams and lakes begins to draw most of the anglers. Two hatcheries in the region keep the streams well stocked. There are mule deer and mountain goats, black bear, and grouse, but the country is too rough for comfortable hunting, and this has aided in protecting the game. Boating, camping, fishing, and scenery are the main attractions.

The larger streams have their sources in the 60 or 70 glaciers and more than 30 lakes that are among the features of the region. The upper courses of these streams are often through wooded or grassy basins, from which they issue in a series of cascades and waterfalls.

Good automobile roads give access to the lower end of Lake Chelan, from the Sunset Highway and the Yellowstone Trail by Blewett Pass and Wenatchee. The new suspension bridge (Beebe Bridge) crossing the Columbia River at Chelan Station, 4 miles from Chelan, offers a convenient way of getting to the lake. Several roads from Spokane, which cross the Columbia either at Wenatchee Bridge or Orondo Ferry, lead indirectly to Lake Chelan.

Visitors who go by rail leave the main line of the Great Northern at Wenatchee or Oroville and take a branch road to Chelan Station. The 4 miles to the lake is by stage. Daily boats from Chelan, at the foot of the lake, carry tourists to all up-lake points and deliver mail and supplies. Guides and packers with pack trains may be secured at Lucerne (at the mouth of Railroad Creek) and at Stehekin (at the head of the lake). Hotel accommodations may be found at Chelan, Moore Point, Lucerne, and Stehekin.

Most visitors stay at the hotels or in some of the many camping places along the lake. The best camps are on the bars at the mouth of the streams, where an abundance of wood and water and level ground makes camping easy. The best fishing is also at the mouths of the streams. Big Creek, Twin Harbor, Bear Creek, Prince Creek, Railroad Creek, and Riddle Creek have large summer colonies. There are many other good camps, principally along the southwest shore.

Many campers prefer the Stehekin River Valley, which is reached by a road starting at Stehekin and extending 16 miles up the river. In late August and early September huckleberry picking and bear hunting attract many travelers to this region. During the season stages meet the boat and carry tourists and campers to Beartrap Springs, Agnes, Bullion, or Bridge Creek. Camping spots may be found almost anywhere along the stream. The road ends at Bridge Creek, which is the center of some of the best fishing and scenery in the Forest and convenient to large huckleberry patches.

Campers in the Lake Chelan region miss a great deal if they do not make a trip to the upper country. The best way is with a pack outfit. The 22-mile trip



Cut-throat trout caught at the head of Lake Chelan—Chelan National Forest

from Lucerne to the head of Railroad Creek furnishes good fishing all the way, with plenty of camping places, of which Ten Mile, Hart Lake, and Lyman Lake are the best. Special attractions are the Lyman Glacier (a body of ice $1\frac{1}{2}$ miles long by a mile wide) and Bonanza Mountain, 9,500 feet high and the tallest peak in Chelan County. The trail is excellent for a large part of the way, and makes Lyman one of the most accessible glaciers in America. The wonderful landscape which greets the traveler in Cloudy Pass includes Glacier Peak, with Mount Rainier 100 miles farther south, and the intervening summit of the Cascades. The return trip may be made by way of Agnes Creek and Stehekin. Three days are sufficient for this trip, but the wise traveler allows five or six.

From Stehekin a number of good trips are possible, varying in length from part of a day to several days. War Creek Pass offers a worth-while one-day trip, as does also the trip to Agnes Creek and return. Two days should be given to the Rainbow Creek trip. Most tourists visit Rainbow Falls and the State hatchery, a short distance from the falls, which are about 3 miles from Stehekin.

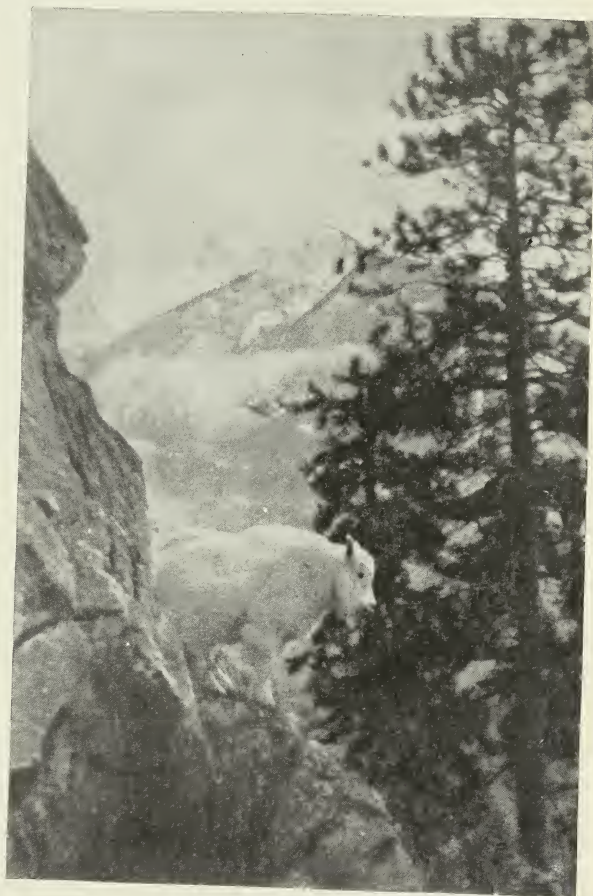
Tourists bound for Bridge Creek Camp by wagon should allow a day for the trip from Stehekin. There are many delightful foot or pack-horse trips, starting at Bridge Creek Camp. A two-day trip to Doubtful Lake, above Cascade Pass,

where one can look down on the Olympics and Puget Sound in clear weather, is specially recommended. Side trips may be taken from Horseshoe Basin (a great amphitheater of the main range) to Thunder Creek Glacier, at the head of Park Creek. There are good camps at Cottonwood, Park Creek, and the upper and lower Park Creek meadows, in the upper basin. Three miles east of Bridge Creek is the glacial valley of the North Fork, 10 miles long, surrounded by peaks running up to 9,300 feet in elevation, and with a number of hanging glaciers along the west side. There are good camps at frequent intervals and plenty of huckleberries in season.

Falls at the mouth of the North Fork have kept out the fish, but fishing in the main stream from the North Fork up is excellent. Twisp, State, and Rainy Passes afford very pleasant camping places, with remarkable scenery. The fishing, which is good all the way up the stream, culminates at Rainy Lake. The game trout swarm around the mouth of the creek emptying into the lake from the

great glacier on the south bank. This trip can be taken from Stehekin in four or five days, but to get its real benefits a week or ten days should be devoted to it.

Most of the important valleys along Lake Chelan have fair trails leading into them and offer many excellent trips. However, it is not always convenient to get horses and guides to go into the country south of Railroad Creek.



Mountain goat—Chelan National Forest

Entiat Valley, which opens into the Columbia Valley at Entiat, parallels Lake Chelan and offers excellent outing opportunities for visitors. A road passable for automobiles extends 30 miles up the Entiat. The best camps are on the last miles of the river road. The one at Silver Creek, at the end of the road, is popular. Trips into Entiat Valley usually outfit at Entiat, where horses can be hired. Mad Lake, the Entiat Glacier, and the picturesque heights on both sides of the valley are readily accessible, and fishing in the river and many of its tributaries is good.

The Forest Service has surveyed several groups of summer home sites at various points along Lake Chelan, where lots may be leased at from \$10 to \$15 a year. The Forest Supervisor, at Okanogan, Wash., or the Deputy Supervisor at Chelan will be glad to answer any inquiries about summer home permits or give information concerning routes and arrangements for camping trips. District rangers are located at Chelan, Stehekin, and Stelik Ranger Stations.

COLUMBIA NATIONAL FOREST

THE Columbia National Forest lies in the southern part of the State and extends from the Columbia River northward to the Cispus River and from Mount Adams westward to Mount St. Helens. It lies on both sides of the Cascade Range.

A system of roads and trails, with a total length of 534 miles, gives easy access to points of special interest within the Forest. Forest travelers unfamiliar with the country will have little difficulty in finding their way, because there are signboards along trails and at important trail intersections.

Game is fairly abundant, and the well-stocked streams and lakes furnish excellent sport for the angler during the open season.

The outfitting points for the eastern side of the Forest are Guler and Trov Lake, Wash., about 26 miles north of White Salmon, the nearest railroad point. An automobile stage, daily except Sunday, connects White Salmon with Guler. Automobiles for special trips can also be obtained at Guler. Not only hotel accommodations, but also saddle horses, pack horses, packers, and guides usually may be secured at Guler.

The base of Mount Adams is 12 miles north. This notable peak has an elevation of 12,307 feet and its summit is crowned with perpetual snow, while extensive glaciers hold its upper slopes in their icy fingers. These glaciers present great



Spirit Lake—Columbia National Forest

variety and individuality. Some are very steep and broken, others steep and smooth, and still others are not only smooth, but have an easy grade. The Klickitat Precipice, on the east side of the mountain, almost perpendicular and nearly a mile high by 4 to 5 miles long, is a striking natural phenomenon with its face of glistening ice and varicolored rocks.

Bird Creek Meadows, embracing about 3,000 acres, is a most delightful mountain park and makes an ideal place for camping. Among its attractions are grassy meadows, highly colored alpine flowers, groves of evergreen trees, snow-fed streams, numerous waterfalls, and a dozen small mountain lakes.

The series of lava caves accessible from Guler by automobile is of considerable interest to tourists. One of these caves, 7 miles west of Guler, is so well protected from summer heat that it contains ice during the entire season.

The extensive huckleberry patches, reaching from South Prairie northward to Dead Horse and westward to the Racetrack and Twin Buttes countries, attract many visitors during August and September, who come for the combined purposes of picking berries and enjoying a vacation in the mountains. A lava bed, 10 miles

long and from 1 to 5 miles wide, in the vicinity of Indian Racetrack, extends east to Goose Lake and south to Lava Creek and South Prairie. Forest growth already changing this from a desolate barren into a timber-producing area of much beauty. In the smooth lava near Goose Lake there are distinct impressions of a pair of human hands and feet, which have caused considerable conjecture as to the origin. It is the opinion of scientists who recently visited the region that these impressions were cut in the lava by some Indian medicine man.

An interesting 10-day trip starts at Guler and carries the traveler by way of Mount Adams and the Cispus River divide to Mount St. Helens, through the beautiful Nigger Head and Blue Lake countries, where excellent camping places and abundant forage for horses can be found. The view from Craggy Peak (north of Blue Lake, and fairly easy to climb) is well worth the effort it requires.

Return may be made by way of the Spirit Lake—Guler Trail, which passes through some splendid stands of timber and also crosses the Lewis River burn where the effects of fire on the forests are very apparent.

The Forest Service maintains a forest nursery and experiment station 10 miles up Wind River Valley from Carson, Wash. Visitors have the opportunity of seeing millions of baby trees growing under cultivation. Just before planting season about 2,000,000 of these trees are taken up annually and shipped to planting areas on the various Forests of Washington and Oregon, where they are set out to restore areas on which fire has destroyed the natural tree growth.

Five miles further up Wind River are Government Mineral Springs and Soda Springs, which are accessible by automobile. Hotel accommodations are available at Government Springs. The water from these springs is pleasing to the taste and is credited with certain medicinal qualities. For persons who prefer to camp there are suitable camp grounds. Wind River, a short distance from the springs, provides fair fishing.

A number of interesting side trips may be taken from Government Springs. The trip to the falls of Falls Creek is perhaps the most popular. These falls have a total drop of about 250 feet and consist of a series of cascades and vertical falls. They are located about 5 miles from Government Springs and may be reached by a good trail. The timber near the springs is being logged, but areas immediately adjacent and fringes of timber along the streams are being reserved for scenic purposes.

The St. Helens country may be reached from Castle Rock, Wash., as an outfitting point. A road 47 miles long, passable for automobiles, connects Castle Rock and Spirit Lake. This road is being improved by the Forest Service and Cowlitz County. At present there are no hotel accommodations at Spirit Lake, and tourists should take necessary provisions and camping equipment.

Spirit Lake lies at an altitude of 3,199 feet, about 3 miles north of the base of Mount St. Helens. The lake is 3 miles long and averages over one-half mile in width. It is famous as a fishing place. Here, on land occupied under special use permit, is the permanent camp of the Portland Y. M. C. A. Boys' Department. The Forest Service maintains a public camp ground on the south shore of the lake, where tourists and campers are always welcome. A heavy forest surrounds the lake. The Forest Service has surveyed 59 summer home sites along the south shore of the lake, which are open for leasing by the public at prices ranging from \$7.50 to \$10 a year, depending upon location. More definite information concerning these sites may be obtained from the District Ranger at Spirit Lake or by addressing the Forest Supervisor, Portland, Oreg.

Mount St. Helens, 9,671 feet high, is the youngest mountain in the Cascade Range. Because of its youth, its surface is smooth and its shape more symmetrical than those of the older peaks. Eruptions occurred as late as 1842, and at the present time there are fissures from which sufficient heat is exuded to cook rice overnight. On the summit is a fairly level area of about 50 acres. This mountain is most easily climbed from the southern side, but no great obstacles are encountered in ascending from the north. Persons not accustomed to mountain climbing should not attempt it without a guide. The glaciers of Mount St. Helens (noted for their cleanness and their crevasses) and the wells and caves are features which draw an increasing number of visitors each year. Lava flows containing enormous caves occur on the southwestern side. Almost perfect casts of trees and logs are also found in the stone. These lava flows are most easily reached from Woodland, Wash. An automobile road up the Lewis River makes travel possible to within 1 mile of the most interesting features.

The supervisor's headquarters is in the Post Office Building, Portland, Oreg., and district rangers are located at Stabler, Guler, and Spirit Lake.

COLVILLE NATIONAL FOREST

THE Colville National Forest lies in the Kettle River range of mountains, which is unique in that it is isolated from other mountain ranges of the State. The elevation varies widely, from 950 feet at Oroville to 7,200 feet in the Kettle River Range. This variation of elevation is reflected in the varying conditions of weather and in plant and animal life.

Considerable early history of the Northwest was made in this region, Fort Colville, near Kettle Falls, being established in 1814. At this point the Columbia River falls nearly a hundred feet, the huge volume of water pouring over the granite rocks making a scene which attracts more than local visitors. Tourists drive to the cliff, where the road commands a view of the falls. Here they leave their cars and walk down the shady trail to the very edge of the cascade, where, in May and June they are often able to secure pictures of salmon leaping into the air in their efforts to climb the waterfall. In the quieter eddies below the falls one may see thousands of eels attached to the under cliffs to rest and waving with the current like sea moss.

Adjacent to the Colville National Forest for nearly 100 miles the Great Northern Railway follows the shore of Kettle River up Curlew Valley and past Curlew Lake to Republic, a mining camp from which considerable gold and silver have been shipped. The railroad also extends from Curlew to Oroville, near the outlet of Osoyoos Lake. Tourists may visit the remotest settlement in the Colville National Forest by automobile and secure camping supplies from towns on or away from the railroad. Outfitting towns on the railroad are Marcus, Boyds, Orient, Danville, Curlew, Republic, Oroville, Tonasket, and Riverside. Towns away from the railroad where provisions may be had are Wauconda, Anglin, and Chesaw. There are excellent approaches to the Forest from any direction.

In addition to the railroad, State roads No. 10, No. 4, and No. 22, with their tributaries, intersect the Forest. The Forest Service owns and maintains telephone lines connecting ranger stations, fire-patrol stations, and lookouts, and reaching all the towns mentioned and dozens of other points convenient to roads and trails.

The Forest is remarkably well supplied with large and small game and upland birds, which may be hunted during the open seasons. Trout fishing is good in nearly all the streams. The San Poil River is well stocked with salmon and trout.



On the heights

Eastern brook and rainbow trout are found in all the principal lakes. There are excellent outing opportunities on all parts of the Forest.

Marcus is a railroad junction and division point and a ranger headquarters. From Marcus Lake Ellen may be reached by automobile, train, or pack outfit. Here are excellent fishing and hunting—trout and bass, upland birds, and deer in season.

A visit to Sherman Creek Falls makes a delightful trip, with camping and trout fishing and deer, bear, and bird hunting in season. Travelers may leave their automobiles at the summit of Sherman Creek road and visit the Columbia Lookout station by a 1-mile trail trip. Here may be obtained a magnificent view hundreds of miles in extent of the snow-capped mountains—the mountains of Canada to the north, the Cascades to the west, and the Bitterroot spurs to the east.

For rugged mountaineering and big-game hunting, the visitors should take a pack trip up Boulder Creek from Orient. This region supports many black and brown bear. A ranger is stationed at Orient, who will be glad to give information concerning the district.

There is good trout and grayling fishing all along the Kettle River, up which the trip may be made from Danville. There are hundreds of ideal camping places along this river. For boating and trout fishing Curlew Lake is recommended. Boats may be hired at Pollard. With a standard spoon hook and a 150-foot line sportsmen may secure plenty of excitement at Curlew Lake. A ranger is stationed at Danville. The Forest Supervisor's headquarters are at Republic, which is the outfitting point for a number of delightful camping, fishing, and hunting trips. Swan, Amy, and Long Lakes are the goals of wagon trips that promise splendid sport. The San Poil River, which may be reached by automobile, furnishes excellent trout fishing with fly or bait. Tons of salmon are caught from the San Poil River annually.

Bonaparte Lake is reached by automobile from Molson or Republic. The lake is locally famous for its recreation attractions, especially trout fishing and camping.

Near by, on a good road, is Lost Lake, where a bathhouse, springboard, and shelters have been provided by the Forest Service for the use of the public. Lost Lake is closed to fishing, as the State of Washington has a fish hatchery here from which a great portion of the fry used in stocking the waters of eastern Washington are taken. The Forest Service maintains a summer patrol station at Lost Lake, with telephone connections to Wauconda.

The climb to Bonaparte Lookout rewards the traveler with a magnificent view of the mountains of Canada and the beautiful Chopaca Range to the west.

Beaver Lake, 4 miles distant by trail from Lost Lake, furnishes excellent black-bass fishing. Crawfish Lake and Lost Creek, where fishing and hunting in season are good, may be reached from Riverside or Tonasket.

Information about further trips on the Colville Forest, or concerning summer home sites, may be obtained by addressing the Forest Supervisor, Republic, Washington.

OKANOGAN NATIONAL FOREST

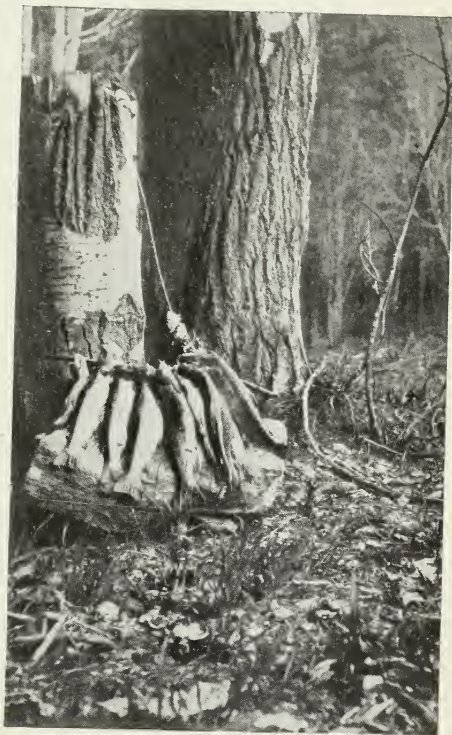
THE Okanogan National Forest is a paradise for sportsmen. Deer, bear, grouse, rainbow trout, and brook trout are abundant. Conconully is a famous hunting and fishing center. Early Winters Creek, near Mazama, is a favorite fishing stream, accessible by automobile. All through this region there are fish for the fisherman and deer for the hunter. A true sportsman will, how-

ever, provide himself with a copy of the game laws and will obey them, in order that there may be some game left for the other fellow.

The Okanogan National Forest extends from the summit of the Cascade Range east to the valley of the Okanogan, north to Canada, and south to the Sawtooth Mountains, which separate the waters of the Methow from those of Lake Chelan.

With the exception of the fertile Methow Valley, it is all mountainous country, great stretches of which are almost unexplored. The shepherd with his flocks, an occasional prospector or trapper, and forest officers are practically its only frequenters. Parts of it, like the mysterious canyon of Lost River, are known to very few. This back country can be reached by trails, and offers unique enjoyment to the man who loves the wilderness. The northern section of the Cascade Mountains is perhaps its most rugged and beautiful part. High peaks, glaciers, and waterfalls abound. The mountain goat, which is rapidly disappearing in the more southern mountains, makes its home here and is frequently seen. There is no open season for killing this rare animal. Deer and bear are little molested. Deer may be hunted from October 1 to November 15, inclusive. The larger streams furnish excellent fishing, having never been fished out. Entering this country from the Methow or Okanogan, one finds abundant horse feed, which makes leisurely travel possible.

Automobile tourists may reach the Okanogan Forest by a 5-hour drive from Wenatchee up the Columbia River to Pateros, turning here up the Methow to Twisp, Winthrop, and Mazama on State Road No. 12. Frequent byroads lead to smaller tributaries. Many good camping places are found along the main road, particularly at Gold Creek, up the Twisp River, and along the west fork of the



Brook trout

Methow. The lower hills are covered with a comfortable shade of open yellow pine timber. The streams are clear and swift.

From State Road No. 12, trails lead 12 or 15 miles to the rugged peaks of the Sawtooth Mountains, 8,000 feet high, which overlook Lake Chelan in its wonderful setting of mountain scenery. Trails also lead down from the summit to the shore of the lake, a distance of about 6 miles.

There are trout in the streams and deer in the hills, and stores and farm houses along the valley to furnish supplies. Innumerable sheltered places invite the tourist to camp in quiet enjoyment. At Alta Lake, near Pateros, the water is clear and warm enough for bathing. Sixty-five miles up the valley the road narrows to a "narrow gauge," or trail, which leads through Harts Pass and the down the western slopes of the Cascades and along the route of the proposed State road crossing the mountains to the coast. At Twisp a road strikes east crossing the Okanogan Range at an elevation of 4,000 feet and going down to Okanogan. This is usually open to automobiles by May 1, and has excellent places to camp in the yellow pine timber, particularly near Sweat Creek Range Station, where the country is smooth and pleasing, having an elevation of 3,500 feet above sea level. From Okanogan State Road No. 10 leads up the valley to Oroville, near the Canadian line.

A return trip may be made through the foothills by way of Loomis and Conconully to Okanogan, and thence south to Pateros. From Oroville one may take a popular run into British Columbia around Lakes Osoyoos and Okanogan. There is a Government reclamation project and dam at Conconully. Many attractive places invite the tourist to camp along the route. One can find hotel accommodation and make the trip from Wenatchee to Okanogan, Oroville, Conconully, Twisp, and return to Wenatchee in three or four days; but many prefer to go prepared to camp and enjoy more fully the cool and shady places along the way.

Tourists looking for an unusually picturesque trip may outfit at Winthrop and go with pack horses up Eight Mile Creek to Cathedral Lake, thence west to the summit of the Cascades, south along the summit to Harts Pass, and return through Mazama to Winthrop. This trip may be made in two weeks, but deserves a much longer time.

At Cathedral Lakes the traveler is near the Bauerman Ridge State sheep preserve, where he may get sight of mountain sheep. At the head of Eight Mile

Creek he is in one of the best mountain goat countries. Both goats and ptarmigan are frequently seen along the route, but may be hunted only with a camera. Here also is opportunity to explore the deep and little known canyon of Lost River, which flows alternately above and below the ground for miles between high rocky walls. Cathedral, Remmel, Sheep, Ashnola, and Windry Peaks may be climbed for the extensive views which they command. Ashnola and Pasayten Rivers furnish excellent fishing, as do other streams and lakes.

The trails follow for miles along open grassy ridges, unique in the Cascades and a great convenience for horse travel. There is much to explore and enjoy. The summit of the Cascades is exceedingly rough and broken, but the old trails are traveled each year by the sheepmen with their horses and many thousands of sheep. It is a wonderful country, with high peaks, glaciers, mountain meadows, and snow fields which are yet to be opened to those who enjoy mountain travel.

Shorter trips, either by horse or afoot, are numerous. One-day trips may be made from Methow Valley to the 8,000-foot summits of the Sawtooth Mountains and thence to Lake Chelan; from Mazama to the summit of the Cascades; from Conconully or Loomis to the Okanogan summits, 6,000 to 8,000 feet high. Tiffany Mountain, 8,775 feet in elevation, can be reached in a day from Conconully. Mount Gardiner, 8,300 feet, offers a difficult climb from Winthrop. Two days should be allowed for this trip. An especially pleasing trip, either on foot or horseback, starts at Twisp, follows the Twisp River to War Creek or Twisp Pass and down to the head of Lake Chelan, where the boat trip on the lake may be made from Stehekin.

For those who desire to build summer cottages or lodges in the cool open shade of the yellow-pine timber there is abundant opportunity. It is especially attractive in the vicinity of Winthrop and Twisp. There is train service to Pateros and comfortable twice-a-day stages up the Methow either to Twisp or to Winthrop. Land can be leased at a moderate rental from the Forest Service. Sites beside automobile roads and within easy reach of supplies are available.

Full use of the National Forests for recreation in all its phases is encouraged. The headquarters of the supervisor is at Okanogan. Rangers are stationed at Winthrop, Twisp, Pateros, Conconully, and Loomis. Information concerning recreation and other features of the Forest may be secured at any of these points.

OLYMPIC NATIONAL FOREST

THE Olympic National Forest is on the Olympic Peninsula, and takes in the entire upper drainage of the Olympic Mountains. Since the extension of the Olympic Highway to the foothills along Hood Canal, the Straits of Juan de Fuca, and Quinault Lake, a great number of people have been able to explore the Olympics.

The rugged crags of Mount Constance, the Brothers, and the Cushman Mountains, as they appear from any point on Puget Sound, do not look easy to scale yet frequently during the summer season parties ascend these high, majestic snow-caps. Mount Olympus, with its many hanging glaciers, has been the main object of most of the larger exploring expeditions. It can be climbed with comparative ease and safety during late summer, although it calls for trail travel of fully 40 miles up the Elwha River. Greater distances must be covered coming up the Hoh from the west, up the Quinault from the south, or over the Dosewallips divide from the east, in order to reach its immediate base. It has an altitude of about 8,000 feet and is the culmination of a group of rugged peaks and high, craggy ridges ranging from 5,000 to 6,000 feet.

Although the valleys and lower slopes of the Olympic Mountains are heavily timbered, many large open park areas are located near the divides; and it is here, during the summer season, that one sees the Olympic elk (Roosevelt elk), an animal protected by law until now it is found in abundance throughout these natural retreats. These park-like woodlands are of special interest, since they are little beyond the exploration stage of development at present. They abound in interesting animal and alpine-plant life.

Crescent Lake, Quinault Lake, and Lake Cushman, situated as they are in densely timbered regions abruptly bordered by steep, high, rugged mountain slopes, almost approach the sublime in natural beauty. For those who do not wish to take their own camp equipment, attractive hotels have been built at these points, and recreational facilities of many kinds have been developed. Trout—Beardsley, Lake Crescent, cut-throat, rainbow, Dolly Varden—and other gamey fish are found in these lakes. A number of summer visitors who come regularly have established summer cottages on the shores on lots rented from the Government at the modest rates of \$10 and \$15 per annum.



Summer home on the shore of Lake Quinault

Crescent Lake is a beautiful, deep-blue body of water 11 miles long by one-half to 2 miles wide. It is set between the timbered slopes of Mount Muller and Mount Storm King, on the northern edge of the Olympic Forest. Here there are good boating, fishing, and bathing. Hotels are available for those who do not care to camp out. There is a daily automobile stage service between Crescent Lake and the Sol Duc Hot Springs, and to Forks, the present terminus of the Olympic Highway. Mora, on the Quillayute, can be easily reached by motor, and from here it is a walk of $1\frac{1}{2}$ miles to La Push, the Indian village of the Pacific Ocean beach. Aurora Camp, Happy Lake, and the Olympic Hot Springs are a few of the interesting objectives in the region for hiking trips. Crescent Lake is located 220 miles from Seattle, on the scenic Olympic Highway. Convenient stopping places are found along the way. For those desiring to follow regular transportation routes a midnight steamer may be had from the Coleman Dock at Seattle. The boat arrives at Port Angeles daily at 7 a. m., from which point large motor stages take the tourists direct to Crescent Lake, 20 miles west. Or one may travel over the Seattle, Port Angeles & Western Railroad, the railroad ticket entitling one to



A wayside camp—Olympic National Forest

take a boat from Seattle at 8 a. m. and 5 p. m., transferring to the railroad at Port Townsend. By this route Port Angeles is reached at noon or about 10.30 p. m. Lake Crescent is unique in being the home of the Beardsley and Crescent trout which are found nowhere else in the world. The Beardsley is the largest known true fresh-water trout. Specimens weighing 24 pounds have been caught in recent years, by trolling with a metal line at a depth of 200 feet. The open fishing season is from April to November, inclusive.

The Quinault Lake region has been made accessible recently to tourists and is rapidly becoming appreciated on account of its picturesque setting among densely timbered mountain slopes, with a background border of high craggy ridges and snow-covered peaks. It is approximately 4 miles long by 2 miles wide. It is located 45 miles north of Hoquiam, Wash., and being on the Olympic Highway can readily be reached by automobile. There is a daily motor stage service between Hoquiam and the lake. Points of interest in this vicinity are Mount Baldy, Colonel Bob, Finley Ridge, and Three Lakes meadow. The canoe trip down the lower river 35 miles through the Quinault Indian Reservation to Taholah, on the ocean beach, is worth taking. High glacial mountains, such as Mount Anderson and some of the large groups surrounding Olympus, offer wilder interest. Good fishing has always been a strong attraction to those visiting this region. Quinault



Elk on Hoh River—Olympic National Forest

Lake teems with rainbow trout and a good variety of small salmon, which may be caught during the open season. Clear and cool drinking water is abundant in springs and small creeks flowing from the mountains. Bathing and boating are features not to be overlooked.

Lake Cushman, located near the lower end of Hood Canal, is somewhat smaller but no less attractive than Lakes Crescent and Quinault. Here also are hotel accommodations and opportunities for canoeing, fishing, and bathing. The upper and more mountainous country is quite accessible from here.

Olympic Hot Springs, which can be reached by road or trail, is 11 miles from the Elwha post office, on the Olympic Highway. It is an especially attractive place for those desiring the privileges of hot mineral baths. These springs are free to all. The water flows from beneath the surface of rock ledges in sufficient quantities to accommodate hundreds of tourists. A hotel with reasonable rates is established here, and there are also bath-houses. For those preferring their own accommodations, splendid camping places can easily be had near the springs along Boulder Creek. A camp here makes good headquarters for side trips in quest of the more hardy forms of recreation, such as mountain climbing and hunting in the higher mountains and glaciers. Hunting is fairly good within a few hours of the springs, and there is an open game season.

Deer, bear, mountain lion, and smaller game, such as grouse, quail, and pheasants, are found in portions of the Olympic Forest. For the camera enthusiasts there are mountain parks, dense forests, snow peaks, glaciers, lakes, cascades, and waterfalls, and wild animal life. Of the latter, the Olympic elk are of the greatest



Falls and canyon on Soleduck River

interest to the average mountain visitor. It is estimated that there are more than 5,000 elk to be found within the Olympic National Forest. They are often seen in bands of from 20 to 100, particularly in the larger mountain meadows and valleys of the central and western slopes. Approximately 2,000 of these animals winter in the Hoh Valley alone. The other popular haunts are the Queets, Elwha, Quinault, Soleduck, and Bogachiel Valleys, in the order named. There is no open season for killing elk, though there is no law against hunting with a camera. The blacktail is the only species of deer known to range in the Olympic Mountains and may be killed only during the month of October. Black bear are fairly common, and cougar are rather frequently found. The

large timber wolf, a menace to young deer and weak elk during the season of deep snows, is becoming rare. Wildcat, marten, fisher, beaver, marmots, squirrels, rabbits, mountain beaver, and chipmunks are the more common smaller wild animals.

The Forest Supervisor's headquarters is at Olympia, and district rangers are located at Port Angeles, Quilcene, Hoodspport, and Olson, Wash.

RAINIER NATIONAL FOREST

RAINIER NATIONAL FOREST extends from the White River on the north to Mount Adams at the south, and from the headwaters of the Skookumchuck River on the west to the lower reaches of the Naches River on the east. Mount Rainier National Park is entirely surrounded by the Rainier National Forest.

The larger streams of the Forest are the White, Cowlitz, Cispus, and Tieton Rivers, and the Naches and its tributaries. The main divide of the Cascades separates the Forest into two parts quite different in climate, landscape, and forest cover. Dense forests of fir, cedar, and hemlock cover the valleys and lower foothills of the west side and traveling is limited to the trails. There is little forage except on the summit of the higher ridges. On the east slope the timber is open and there are few localities where grass is not abundant.

The Cascade divide extends north and south through the Forest, reaching an elevation of 12,307 feet in Mount Adams and 8,201 feet at the Goat Rocks. The general elevation of the summit is about 5,000 feet. It is a subalpine region and includes many open parks and grassy meadows, where there is pasturage for saddle and pack animals.

Many of the forest streams are well supplied with cut-throat and rainbow trout. The Dolly Varden is common, except in the smaller streams. It is much inferior in flavor to the other trout species. Great numbers of trout are caught in Packwood Lake and the Green Water Lakes. The best trout streams are the Naches, the South Fork of the Tieton, and upper Bumping River on the east slope and the tributaries of the Cispus and Cowlitz on the west slope. A fair catch can be made in nearly all the streams, but the best fishing is in those most remote and least accessible.

Deer are abundant, but not easily seen or hunted except in sparsely timbered areas of high elevation. Elk, which have been introduced, are rapidly increasing under the protection of the game laws. Black bear are abundant, and mountain goats are occasionally seen. The pheasant and the grouse (or "hooter") are the most common game birds. Mountain and California quail are not uncommon, and ptarmigan are occasionally seen at the higher elevations. The State game and fish laws apply to National Forests, and Forest officers cooperate with the State authorities in their efforts to preserve by careful use the game resources of the State.



"Bow string" pack bridge over Rattlesnake Creek—Rainier National Forest

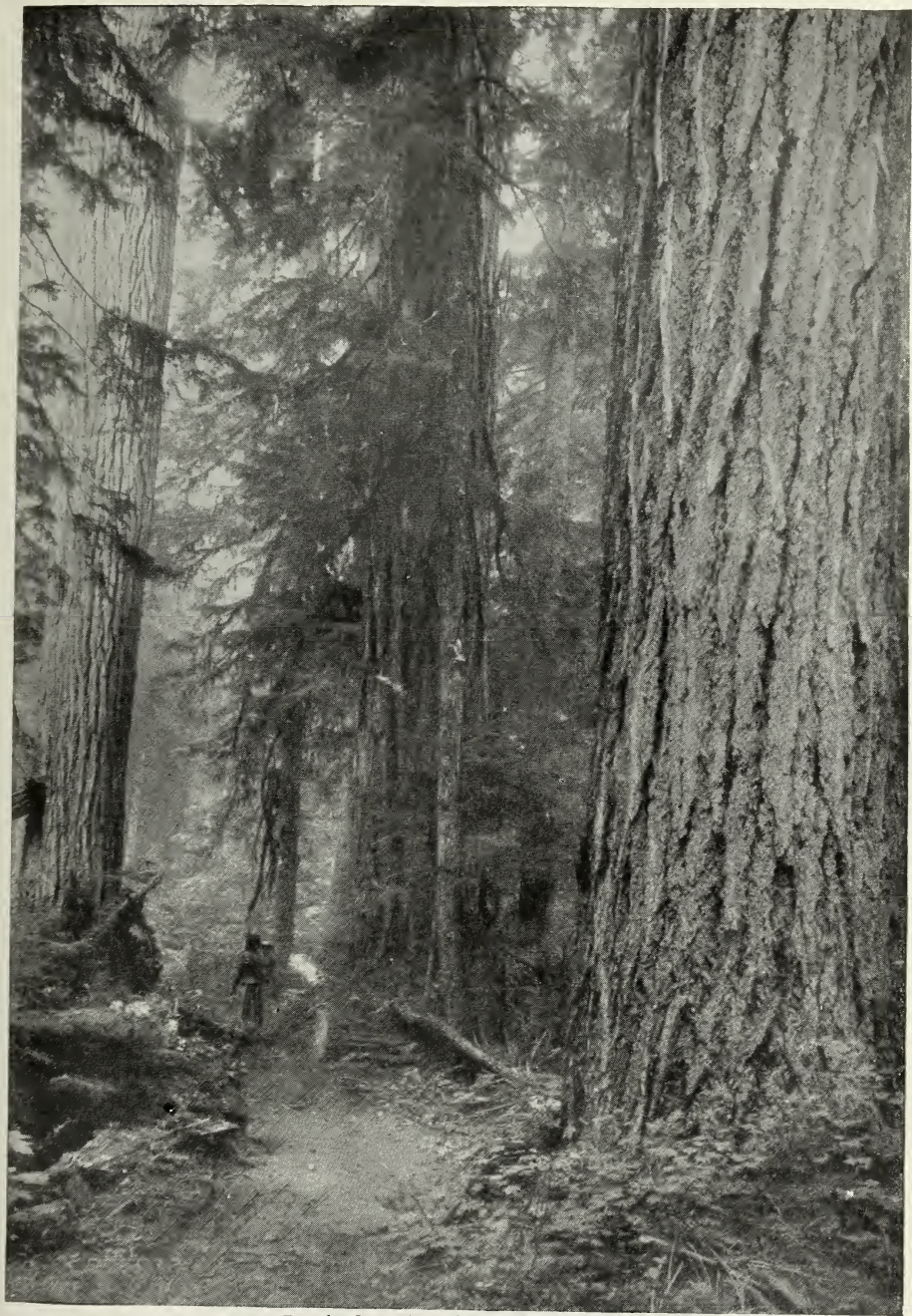
Roads lead into the Forest along the larger stream valleys, but have not yet been completed across the summit of the Cascades. State highways carry the travel from Tacoma and Seattle well into the Forest along the White, Nisqually, and Cowlitz Rivers.

McClellan Pass Highway, built by the Forest Service and the State, is now completed as far as The Dalles of White River and is under construction to the northeast corner of the National Park. From Enumclaw this road is through a dense forest, the timber of which is straight and tall.

A summer-home colony is growing up beside this highway, just above Silver Creek. This stream receives its name from the succession of silvery white falls and cascades along its course.

The National Park Highway from Tacoma to Mount Rainier follows the Nisqually River in the Rainier National Forest for 3 miles.

A fairly good trail, starting near Copper Creek in the Nisqually Valley, extends north across the Mowich and Puyallup watersheds, through heavy timber, to the Carbon Valley at Fairfax.



Douglas fir on the Rainier National Forest



At the top of the divide—Rainier National Forest

A passable road extends up the Cowlitz Valley to Lewis, where there is a hotel and store. A trail leads from Lewis to Packwood Lake. Lewis is 16 miles by trail from Longmire Springs. From Lewis the Chanapecosh Hot Springs are reached by a 14-mile trip, partly by road and the remainder by trail. The Goat Rocks are high snow peaks about 15 miles distant from Lewis, situated in a region that is particularly attractive.

A graded trail extends from Longmire Springs to Mount Adams, at the south end of the Forest. This trail leads through a country of many scenic attractions and makes a foot or horseback trip well worth while.

The Chain of Lakes country is a high but comparatively level region just below the snow hills on the west slope of Mount Adams. It is a favorite berry-picking and hunting ground of the Indians, who go there by hundreds during the latter part of August.

The traveler may proceed from the Chain of Lakes to Glenwood, or Trout Lake, and thence to Portland by stage and train. The entire trip from Tacoma by Longmire Springs, Chain of Lakes, Glenwood, or Trout Lake, to Portland may be made

in from ten days to two weeks, and affords an excellent opportunity to see the south slope of Mount Rainier in the National Park, and the west slope, the summit, and the east slope of the main Cascade Range in the Rainier National Forest.

The Mount Bel and Lake Christine region is one of the most beautiful places in the Forest. It is a mountain country, with many small clear lakes and alpine meadows.

On the east side of the Forest, wagon roads passable by automobile extend up the Naches and Tieton Valleys from Yakima and Ellensburg. Hotel accommodations can be obtained at Bumping Lake and on the Naches at the mouth of Bumping River. There is also a wagon road into the Forest up the Taneum Valley. Many summer-home sites are located north of the junction of American and Bumping Rivers, and may be reached by automobile up the Naches Valley.

A splendid horse trip carries the traveler up the American River to Bear Gap, thence south along the main summit of the Cascades to Carleton Pass, returning by way of Bumping Lake and Bumping River. One of the best views of Mount Rainier may be seen along the summit. This trip requires at least a week's time and should not be undertaken until about the middle of August, on account of snow. There is a tent hotel at the mouth of American River, where accommodations may be secured.

Colonies are growing up on the summer-home site tracts on Gold Creek and along the Naches. These sites are rented from the Government at rates ranging from \$10 to \$15 a year, according to location.

The Forest Supervisor's headquarters is in the Post Office Building, Tacoma. District rangers are stationed at Fairfax, Nile, Enumclaw, Randle, Ashford, Lewis, and Yakima.

SNOQUALMIE NATIONAL FOREST

THE Snoqualmie National Forest is situated in the eastern portions of King and Snohomish Counties, extending from the Pierce County boundary on the south to the Skagit County line on the north. The eastern boundary of the Forest is the main summit of the Cascade Range, while the western line is along the foothills. The principal streams draining this territory from north to south are the Sauk, Stilaguamish, Sultan, Skykomish, three forks of the Snoqualmie, and the Cedar and Green Rivers. Narrow valleys are characteristic of the region, between which the intervening ridges rise in steep slopes



The forest ranger knows the country and is always glad to direct travelers

culminating in high rugged peaks, usually above timber line and in many cases clothed with perpetual snow and ice.

Although close to many cities, the Snoqualmie Forest is one of the most popular regions for sportsmen in the State. Black-tail and mule deer and black and brown bear are found throughout the territory. Deer may be hunted only during the month of October. Mountain goats at one time were very plentiful, but have been killed off until at present they are to be found only in the most rugged and inaccessible portions of the Forest. Fishing is excellent after the first of July, rainbow trout and cut-throats abounding in all the larger streams. Many of the lakes have been artificially stocked, both with native species and with eastern brook trout. The open fishing season is from April to November, inclusive. Ptarmigan are frequently seen in the higher mountains, and grouse and fool-hens are found in limited numbers at lower altitudes.

Attractive camp sites are situated at short intervals along every creek and among the lakes and meadows in the high country. Along the principal routes of travel the Forest Service has cleared up the most desirable sites for the benefit of the public.

Glacier Peak, 10,436 feet high, is the most noted landmark in the region, and one of the most beautiful snow peaks in the Cascade Range. A large system of glaciers extends around the entire mountain.

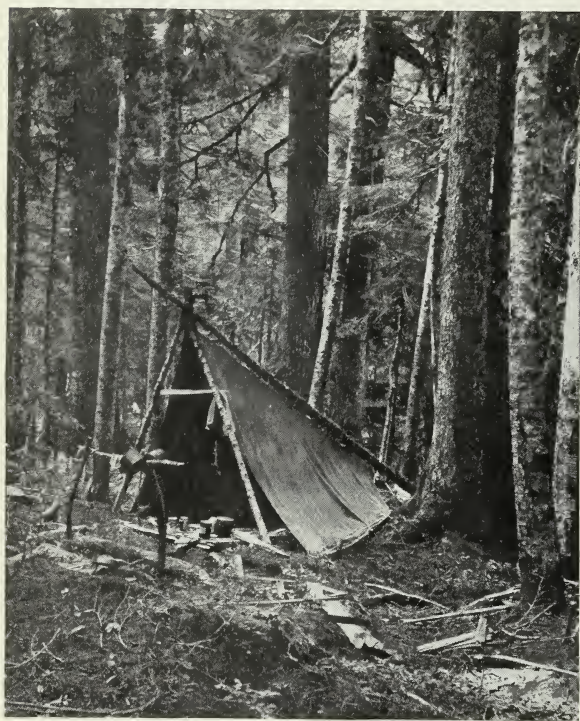
One of the most beautiful and accessible bits of mountain scenery in the State lies along the valley of the South Fork of the Stikine River between Silverton and Monte Cristo. Both sides of this valley are lined with rugged spirelike peaks, which bear many snow fields and living glaciers—a paradise for those who are fond of mountaineering. Several of these peaks have never been scaled.

The Index region, in the lower Skykomish Valley, is well worth visiting. It is walled in by high mountains, such as Index Mountain, Gunn Peak, Baring Mountain, and Mount Persis, which reach elevations of from 6,000 to 7,000 feet. Several beautiful waterfalls in the main Skykomish River are situated here. There are many side trips to charming mountain lakes, such as Isabel and Serens. Farther up the valley the traveler can reach without great difficulty the splendid mountain region surrounding Lake Dorothy. The country around Snoqualmie Pass is the most interesting in the southern portion of the Forest. It is easily reached by rail or automobile and is noted for its beautiful lakes and massive rocky peaks. Snow Lake is an exceptionally beautiful sheet of water, surrounded by towering mountains and glistening snow fields. Franklin Falls is another point of interest.

Accessibility is one of the great advantages of this region from an outing standpoint. All the principal valleys can be inexpensively reached by train or automobile in from 2 to 6 hours from Seattle, Tacoma, or Everett. Regular stage lines run from the Forest to all the larger towns adjacent to its boundaries. Also, it is crossed by the Sunset and Scenic Highways, by the main lines of the Northern Pacific, the Chicago, Milwaukee & St. Paul, and the Great Northern Railways, and is tapped by the Hartford and Eastern and by the Darrington Branch of the Northern Pacific.

Travel off the regular routes is generally arduous, not only because of the steepness of the mountains, but also because of the heavy timber and dense undergrowth. The excellent trails of the Forest Service, marked by frequent guide signs, enable even the inexperienced traveler to reach the most interesting places; but anyone who has not had considerable experience in mountaineering should not attempt to go into the remote sections or off the main trails without a reliable

guide. In most instances, anyone who takes a trail trip will be forced to carry his supplies and equipment upon his back, because pack horses and saddle horses are scarce and there is little available pasturage.



Small but snug

Pack trips of three or four days' duration are perfectly feasible over the main trails, provided arrangements are made to carry sufficient hay and grain.

The best season for camping is between June 15 and November 1, although in some cases there is a month of good weather in April or May. During winter the snowfall is ordinarily extremely heavy, varying in depth from 4 to 20 feet.

UPPER SAUK REGION

Beginning at the north end of the Forest, the last outfitting place is Darrington, at the terminus of a branch line of the Northern Pacific. Darrington is also reached from Arlington, 30 miles west, by automobile or stage over a fairly good road.

Hotel accommodations can be had at Darrington, and supplies, horses, and guides can be obtained at reasonable rates. There are no garages, but gas is available.

Hotel accommodations and supplies can be obtained also at Oso, Hazel, and Fortson, railroad stations between Arlington and Darrington. From Darrington trails radiate in various directions, the most popular being up the Sauk River, over a good route suitable for horses. Excellent camping places are found along it at close intervals. The distance to Clear Creek Ranger Station is 3 miles; to the Whitechuck bridge, 10.6 miles; to Goat Lake, 26.1 miles; and to Barlow Pass, 24.4 miles. From the Whitechuck bridge a horse trail extends up the river of the same name to Fire Creek, 25 miles from Darrington, and it is not difficult to con-

tinue by foot to Glacier Peak, a total distance of 38 miles. The good fishing grounds on Deer Creek are reached over a trail running north from Hazel across the Higgins Range (11 miles) and a branch leads off this trail to the Mount Higgins Lookout Station.

Fishing is especially good in all the streams of this locality. The most popular streams are Boulder Creek, Clear Creek, and the Sauk River from the mouth of the Whitechuck to Bedal, at the junction of the north and south forks of the Sauk. The South Fork of the Sauk is closed to fishing and hunting. There is no fishing in the Whitechuck River on account of the glacial sediment carried by that stream. Good fishing may be had in Deer Creek, which enters the North Fork of the Stilaguamish River at Oso. Deer and bear are fairly plentiful, the best hunting being on Mount Higgins, Squire Creek, and Whitechuck Mountain. Grouse are quite plentiful along the North Fork of the Stilaguamish and on the slopes of Mount Higgins. Owing to the rapid extinction of the game in this region, the Goat Lake Game Refuge was set aside in the hope of increasing the number of game animals. This refuge embraces the entire watershed of the South Fork of the Sauk and that part of the watershed of the South Fork of the Stilaguamish above Perry Creek. Neither hunting nor fishing is permitted on this area.

The best scenic trips include Goat Lake, Glacier Peak, and the headwaters of Clear Creek, and during late summer many inspiring camping places can be found in the higher mountains among the lakes and mountain meadows. The timber is especially fine along the Sauk and the lower portion of the Whitechuck. A fire lookout station is maintained on Pugh Mountain at an elevation of 7,150 feet, from which a wonderful view can be obtained of the Cascade Range from the Canadian boundary to Mount Rainier and Mount Adams. Huckleberries are especially plentiful on Mount Higgins and Jumbo Mountain during the latter part of August and early September. Salmon berries are plentiful along the Sauk River earlier in the season.

MONTE CRISTO REGION

The town of Granite Falls is the last outfitting place for the Monte Cristo region. Hotel accommodations and all kinds of supplies are available, including garage facilities, and the services of guides may be obtained. Hotel accommodations can be had farther up the valley at Silverton and Monte Cristo. Granite Falls, Silverton, and Monte Cristo are on the Hartford & Eastern Railroad. A good

automobile road extends from Everett to Granite Falls, a distance of 20 miles, over which there is a regular stage service. Machines can be driven to Robe, 8 miles farther east.

Many points of interest off the railroad may be reached over a good system of trails, such as the 5-mile trail from Rotary to the summit of Pilchuck Mountain, where a fire lookout station is maintained. A sunset or a sunrise view from this point will leave a lasting impression on the mind of any nature lover. Another good trail leaves the railroad at Mackie, extends up Black Creek to Hoodoo Pass, 4 miles, and continues to Pilchuck Ranger Station, on the Pilchuck River, 8 miles from the railroad. From Silverton a foot trail leads south over Marble Pass, at an elevation of 4,000 feet, continuous down to the Forty-Five Mine (6 miles) and on to Sultan River, 13.1 miles in all. Some of the most beautiful scenery in the locality is along the Sunrise trail, which leaves the railroad about 6 miles east of Silverton and extends south for 11 miles over a high mountainous country to the head of Sultan River. This trail is not in condition for horses, but can be traversed afoot without great difficulty. Vesper Rock can be climbed easily from the trail. From Barlow Pass it is only 10 miles to Goat Lake, over a very good trail suitable for horses. Darrington can be reached from Barlow Pass by the trail down Sauk River, a little less than 25 miles. A foot trail starts at Monte Cristo, leads over Poodle Dog Pass to Silver Lake (1.6 miles), and thence down Silver Creek to Galena and Index. The latter point is 17.5 miles from Monte Cristo.

Fishing is one of the chief attractions in this region, and splendid catches of rainbow trout are made throughout the open season in the South Fork of Stilaguamish River. A number of lakes on the adjacent mountain slopes have recently been stocked with trout and in a few years will provide splendid sport. Hunting is good in the lower part of the valley, deer, bear, and grouse being fairly plentiful. The upper end of the valley has been included within the Goat Lake Game Refuge, and all hunting and fishing is prohibited east of the mouth of Perry Creek. Attractive camp sites are found on the Pilchuck Lookout trail, on the Deer Creek trail, near Kelcema Lake, at Goat Lake, and at Silver Lake near Monte Cristo. The best scenic trips are on the Sunrise trail, the Silver Lake trail, and in the vicinity of Goat Lake. In addition to the wonderful mass of rugged mountains and glaciers, seen even from the railroad, the Stilaguamish gorge between Granite Falls and

Robe is a place of exceptional beauty and interest. Granite Falls, a short distance below, is worth a side trip. During the latter part of August and early September huckleberries and blackberries abound on the slopes of Long Mountain, Dickerman Mountain, and in the vicinity of Silver Lake.

The trip into the Monte Cristo district is especially desirable to those who have only a limited time to spend, as it can be made from Seattle or Everett in one day. This is made possible by the large open sight-seeing cars that are operated by the railroad.

SKYKOMISH RIVER REGION

In the lower Skykomish Valley roads extend from the town of Sultan in a northerly direction toward Sultan Basin for from 6 to 12 miles, beyond which the traveler must go afoot. However, horses can be taken over the Olney Creek route the entire distance of 15 miles. The Sultan Canyon route is more attractive from a scenic standpoint. Farther up the valley the Index region can be most easily reached from the town of Index, situated on the main line of the Great Northern. It can be reached also from Everett over an excellent automobile road, all but 8 of the 25 miles being hard-surfaced. Stage lines operate regularly between Monroe and Index during summer. At Index,



A mountain snowshoe trip in the alpine country around Silver Creek—
Snoqualmie National Forest

hotel accommodations, storage facilities for automobiles, and gasoline may be had, and a full line of supplies and fishing equipment. Guides can be obtained here, but no horses.

Trails lead out in several directions to surrounding points of interest, the most important of which is the North Fork of the Skykomish River, famous for its big rainbow trout. On this trail Galena, an abandoned mining camp, is 9 miles from Index; and the falls of the North Fork, 13 miles. Lake Isabel, a beautiful sheet of water set among rugged peaks, lies 3 miles north of Reiter, from which point it is reached by a trail. Reiter is a railroad point 4 miles west of Index. High upon the slopes of Index Mountain lies Lake Serene, a small body of water reached by $4\frac{1}{2}$ miles of foot trail. Good fishing is found in the vicinity of Index, in the North Fork and main Skykomish Rivers. Hunting is good, and many bear and deer are killed each open season. Grouse are scarce. The majestic beauty of Mount Index is famous throughout the State, and the falls of the main Skykomish River nearby are an attraction to every visitor of the locality.

A new road, giving access by automobile to the entire valley, has been constructed from Index 36 miles up the Skykomish valley to Berlin, Skykomish, and Scenic Hot Springs. The best trip from Berlin or Skykomish is that up Miller River to Lake Dorothy, the 12 miles being covered by an excellent trail. Splendid fishing can be found all along Miller River. Lake Dorothy was artificially stocked some years ago, and now it affords some of the best sport in this part of the State. It is a mountain lake, surrounded with rugged peaks and snow fields, affording most attractive camping places.

A trail extends 8 miles up Beckler River, where there are excellent fishing and many good camp sites. Hotel accommodations and supplies can be had at both Berlin and Skykomish, and in the latter place gasoline is available and the services of guides can often be obtained. At Scenic Hot Springs, in the upper end of the valley, there are good hotel accommodations. From here the main summit of the Cascade Range can be reached by foot without great difficulty, up Surprise Creek or Deception Creek. Numerous small lakes are situated at the heads of these streams. There are good camp sites along all the streams, and fishing is excellent in Tye River.

SNOQUALMIE RIVER REGION

North Bend, 37 miles from Seattle, is the logical starting point for all trips along the North and Middle Forks of the Snoqualmie River, and is reached by railroad and by an excellent automobile road. There is regular stage service from Seattle. Hotel accommodations may be obtained, and all kinds of supplies may be purchased. Several garages will care for cars, and horses and guides are available. A machine can be taken on a fair road from 6 to 8 miles up the North Fork, whence a foot trail continues nearly to the headwaters of this stream. Lakes Hancock and Calligan, on the North Fork, are very popular among fishermen and campers. For trips up the Middle Fork, machines are usually driven as far as Hubbard ranch, a distance of 6 miles. A good horse trail continues up the Middle Fork Valley to the Halfway House, 15.2 miles from North Bend, and on to Goldmyer Hot Springs, a total distance of 28.3 miles. From the Halfway House another trail extends up Pratt River to Pratt Lake (9.2 miles) and Rockdale (15 miles). The trail to Snoqualmie Lake leaves the Middle Fork trail about $3\frac{1}{2}$ miles above the Halfway House, passing Snoqualmie Lake at 12.3 miles and continuing on to Lake Dorothy and Skykomish, 29.5 miles from the Halfway House.

There is splendid fishing in both the North Fork and Middle Fork of the Snoqualmie. Game is abundant, and many deer and bear are killed here every season. A number of elk from the Yellowstone Park were liberated here a few years ago, and may often be seen in the locality. They are protected by State law, under penalty of heavy fines. Magnificent fir and cedar timber occurs along almost the entire length of the Middle Fork valley, and is one of the few remaining samples of the splendid growth formerly found throughout the western part of the State. The mountain scenery is particularly attractive in the vicinity of Goldmyer Hot Springs and Dutch Miller Gap.

ALONG THE SUNSET HIGHWAY

From North Bend the Sunset Highway extends up the South Fork of the Snoqualmie to Snoqualmie Pass, 23 miles; to Lake Keechelus, 29 miles; and thence to Cle Elum and Ellensburg. All points along this route may also be reached easily over the main line of the Chicago, Milwaukee & St. Paul Railway. Hotel

accommodations and gas may be had at Snoqualmie Pass and at various resorts on Lake Keechelus.

Excellent camp grounds have been constructed by the Forest Service at Denny Creek, 20 miles east of North Bend, and are open to the public without charge.



Entrance to the Denny Creek Camp Grounds

Granite Mountain is 5 miles from Denny Creek Camp Grounds, over a branch leading off the Pratt River trail. The South Fork of the Snoqualmie has recently been stocked and is closed to fishing. However, Snow Lake was stocked several years ago, and limit catches are common there. Bear hunting is excellent on Granite Mountain and along Humpback Creek, and grouse are also plentiful.

Running water has been piped through the grounds, and tables, stoves, parking space for automobiles, and other conveniences provided. To reach Snow Lake from this point one travels $2\frac{1}{2}$ miles by road and 5 miles by trail; also a trail leads up Denny Creek for 2 miles to Snowshoe Falls, and another up the main river $1\frac{1}{2}$ miles to Franklin Falls. The trail to Pratt Lake and the Middle Fork leaves the Sunset Highway 2 miles west of the camp grounds, and climbs the mountain on an easy grade to Pratt Lake, a total distance of 8 miles. From this point it continues down Pratt River to the Halfway House, 17.2 miles from Denny Creek, and to North Bend, a total distance of 32.4 miles. A fire-lookout station on the summit of Granite

Deer are reasonably abundant. The scenery is particularly good around Snow Lake and on Commonwealth Creek, where there is a group of high, rocky peaks. From the standpoint of timber the drive between North Bend and Denny Creek Camp Grounds is one of the most beautiful in the State. Franklin Falls offers another attractive feature to the trip. During the fall huckleberries are abundant on Granite Mountain and around Snow Lake.

PROHIBITED AREAS

The valleys in the south end of the Forest are closed to hunters, campers, and fishermen for the reason that they are the source of municipal water supplies. Seattle is dependent on Cedar River and Tacoma on Green River. As previously explained, no hunting or fishing is permitted in the Goat Lake Game Refuge, in the Monte Cristo region.

GENERAL INFORMATION

More detailed information and maps of the Snoqualmie Forest may be obtained from the Forest Supervisor, whose headquarters is located in the Stuart Building, Seattle, or from the district rangers, whose post offices are Seattle, Snohomish, Darrington, and Skykomish.

WASHINGTON NATIONAL FOREST

THE west slope of the Cascade Mountains from the international boundary southward about 60 miles forms the Washington National Forest. It is here that the Cascade Mountains reach their greatest development, spreading out to a width of nearly 100 miles in a stern and rugged region, characterized by narrow shoestring valleys, with little or no bottom land, and flanked by steep slopes, the whole set amidst a vast expanse of mountain peaks.

The Skagit River, which crosses the line from British Columbia, forms with its tributaries the main drainage. For about 20 miles the stream flows south, between low wooded banks, through a comparatively broad valley. Here and there it forms deep, dark pools which tempt the ambitious angler.

Just below Big Beaver Creek the river gains momentum and is literally turned on edge as it passes between the frowning walls of Canyon Diablo, a narrow cleft scarcely 10 feet across, with sheer walls rising upward 150 feet. At low water the canyon may be penetrated by boat.

Emerging from this defile, the river spreads out into a great rock-walled pool, rushing over the rocks and down into the broadening valley in a series of foaming rapids 7 miles in extent. The upper Skagit River country is reached by the county road up the valley from Sedro-Woolley, which is passable for automobiles to a point 10 miles above Marblemount. Pack horses may be obtained at Marblemount, or one may pursue his journey on foot. At the mouth of Goodell, Steattle, and Ruby Creeks are road houses where meals and lodgings may be obtained. Shelters have been erected for the accommodation of camping parties at intervals along the trail. It is known as the Goat Trail, by reason of its roughness, and among its scenic features are the Devil's Elbow and the Giant Stepping Stones.

The main upper Skagit River and its tributaries—including Ruby, Lightning, Big Beaver, and Little Beaver Creeks—are filled with rainbow, Dolly Varden, black-spotted, and steel-head trout, and offer unsurpassed fishing. Hunters with the camera may find black and brown bear and black-tailed and white-tailed deer fairly abundant; and goat, cougar, bobcat, coyote, and various fur-bearing animals are also common. However, all that portion of Whatcom County within the Washington Forest, which includes the four tiers of townships south of the international boundary, has been set aside as a State game preserve, and only the hunting of predatory animals is permitted.

The romance of early mining days still hovers over Ruby Creek. Here are the Butcher Cabin, Ghost Cabin, Goat Stamp Mill, Hidden Hand, Lone Tree Gulch, Nip and Tuck, and many other old prospects and abandoned workings, around which passing years have woven strange and wonderful tales.

Those who prefer the high mountain-meadow country will find along the summit of the Cascades the land of their dreams. Here is an abundance of feed for horses, and one can ride or walk in the bracing air and sunshine, camping wherever night overtakes him. If he has sufficient skill and patience, he may be able to photograph a mountain goat at close range. Splendid fishing is offered by nearly all the streams on the Washington Forest.

Besides the upper Skagit and its tributaries, Illabot Creek and Lake, Finney Creek, and the Suiattle River and its tributaries deserve special mention.

Baker Lake, which is reached by a 17-mile trail from Concrete, a railroad and outfitting point, is attractive to many people who enjoy camp life. There is a



Forest Service trails lead deep into the heart of the woods and mountains—Thunder Mountain and Pyramid Peak

large fish hatchery located beside the lake. The photographer may find plenty here to try his skill—Mount Baker and its reflections in the clear waters, the shifting shadows of massive Mount Shuksan, and the picturesque Old Baldy standing near by.

Five miles above Baker Lake, on the eastern slope of Mount Baker, are Baker Hot Springs, where the water bubbles from the ground at a temperature of 110° F. A small natatorium has been constructed here and an open camping shelter, which will accomodate half a dozen tourists. A stone fireplace in front reflects heat into the shelter.

Mount Baker, 10,827 feet high, lies far to the westward and entirely detached from the main Cascade Range. This beautiful mountain, surrounded by mammoth glaciers which resemble the frozen tentacles of a mighty octopus, and by far-flung ice fields, crashing waterfalls, towering pinnacles, and awe-inspiring vistas, is situated within 30 miles of tidewater and the Pacific Highway.

Adjacent to the mountain on the north, at an elevation of 7,000 feet, are Skyline Meadows. These may be reached from Bellingham within a half day,

the trip being by automobile, except the last 5 miles, which is over a first-class trail. These meadows comprise hundreds of acres of open land, which may be traveled with ease. The dominant feature of the landscape is the massive form of Mount Baker, which glistens and towers beyond an undulating vista dotted by alpine firs standing as sentinels amid the green mountain meadows.

The town of Glacier, which lies just inside the Forest, is accessible by automobile. From this point the survey of the Glacier-Austin Pass section of the Mount Baker Highway has been completed. This road follows the North Fork of the Nooksack River and ascends Bagley Creek into Austin Pass, which lies midway between Mount Baker and Mount Shuksan, and is the center of one of the most beautiful mountain-meadow regions in the northwestern part of Washington. From Shuksan, at the base of Austin Pass, this road will render many points of interest easily accessible by trail. Among these high spots in the heart of the mountains—splendid camping places and commanding a view of extensive stretches of country—are Twin Lakes, Hannegan Pass, and Welcome Pass. Mount Shuksan, which may be climbed from Austin Pass, is a peak of unusual picturesqueness. Table Mountain, on the other side, is a striking formation, and beyond it lie the Chain Lakes, at the head of Wells Creek.

A trail leads from Glacier to Heliotrope Ridge, a distance of 10 miles. Like a valiant warrior, this slender ridge has thrust its verdant crest deep into the armor of ice which incrusts the slopes of Mount Baker. On both left and right

Glaciers are winding
Crushing and grinding
Hurling their tribute
From dome to the sea.

The tree-flecked slope is covered by a luxuriant growth of mountain heliotrope. A shelter camp which will accommodate from 6 to 10 people has been erected upon the summit of the ridge.

Deming is the nearest outfitting point to Mazama Park, another beautiful camping spot adjacent to Mount Baker on the south. The distance is 24 miles—13 by automobile and 11 by trail. From Mazama Park the mountain can be ascended without great difficulty. There is splendid fishing in Elbow Lake and the South Fork of the Nooksack, easily accessible from Mazama Park.



Down Hannegan Pass

BAKER RIVER AND LAKE

Baker River empties into Skagit River near the town of Concrete. Baker Lake is 18 miles from Concrete, and is reached by trail on the east side of the river. For trips to the lake or other points in this region, saddle and pack animals can be secured in Concrete, also packers and guides. The trail passes splendid camping grounds, where water and fuel are abundant. Baker Lake itself is about $\frac{1}{2}$ miles long by 1 mile wide, with ideal camping places along the lakeside. Mount Baker, with its eternally snow-covered dome, and Mount Shuksan may be seen in the wonderful lake reflections, thought by many to be equal to any in the world. Baker Lake is the only known spawning ground of the sockeye salmon in the United States. A Federal fish hatchery is located here.

CASCADE RIVER—CASCADE PASS

Cascade River, entering the Skagit near Marblemount, is a beautiful glacier-fed stream. It traverses fine river bottoms where there are splendid camping places, and runs through canyons with excellent waterfalls and rapids. Fishing

is good for Dolly Varden, rainbow, and steelhead trout in season. Salmon are taken nearly every month of the year near the foot of the first falls, 8 miles from Marblemount. Marblemount, 10 miles by automobile from Rockport, the railroad terminus, is the logical outfitting point for a trip to the Cascade River watershed. At Marblemount are two hotels, a store, and a post office. Guides and packers will furnish saddle or pack animals for large or small parties.

Cascade Pass, at the head of the river, 25 miles from Marblemount, is a beautiful flower-covered park, where fascinating camping spots are numerous. Although it is not considered a particularly good hunting country, game is present at all times. Mountain goat are found on the highest elevations of the surrounding mountains. Through Cascade Pass the trip may be continued to Lake Chelan.

Mineral Park, an abandoned mining camp 18 miles from Marblemount, has still an interest for the tourist, although 25 years have elapsed since the silence of the hills was broken by the sound of the miners' pick and shovel. Here are sluice boxes, gold pans, and decaying and crumbling prospectors' cabins, mute witnesses of their owners' blasted hopes of great wealth. The trail which runs on the north side of the river and up the north fork is well posted with signboards, as are also all cross and branch trails, so the traveler may not get lost. A telephone line follows the trail as far as Mineral Park, and may be used by tourists in case of need.

SUIATTLE RIVER

Sauk is the railroad point from which to start this trip. A wagon road leads to Sauk Crossing, where one must ford his saddle or pack animals to the east bank of the Sauk River in order to take the trail leading up the Suiattle River proper. The horses and ponies must swim and the travelers cross in an Indian canoe. This ford is dangerous at all times to those unacquainted with it, and should not be attempted unless there is an experienced white man or Indian present. Once across the river, there is an excellent trail leading to the Suiattle Pass, 48 miles from Sauk, where one may leave the Washington and enter the Chelan National Forest.

The Suiattle River is a poor trout stream except to the bait fisherman. However, its tributaries are teeming with game fish, where the man who must make his catch with a fly or not at all may have glorious sport. Good fishing



Skagit River bridge—Washington National Forest

streams are Big Creek, 15 miles from Sauk; Tenas Creek, 18 miles; Buck Creek, 25 miles; Downey Creek, 33 miles; Sulphur Creek, 35 miles; and Canyon Creek, 41 miles. Milk Creek, which flows into the Suiattle from the south, off the slopes of Glacier Peak, is a "white water" stream and worthless for fishing.

The Suiattle River Indian tribe, whose ancestors have hunted and fished on the watershed for untold generations, add to the interest of this trip. They are pure-blooded Indians, uncontaminated to any extent by association with white men, and furnish a splendid opportunity for a study of the barbarian in his native haunts. The Suiattle River Indian will not disturb your camp or steal anything, no matter how long you may be absent. However, the camper must watch the Indian dogs and place everything edible out of reach. Otherwise something good to eat may be stolen right before his eyes.

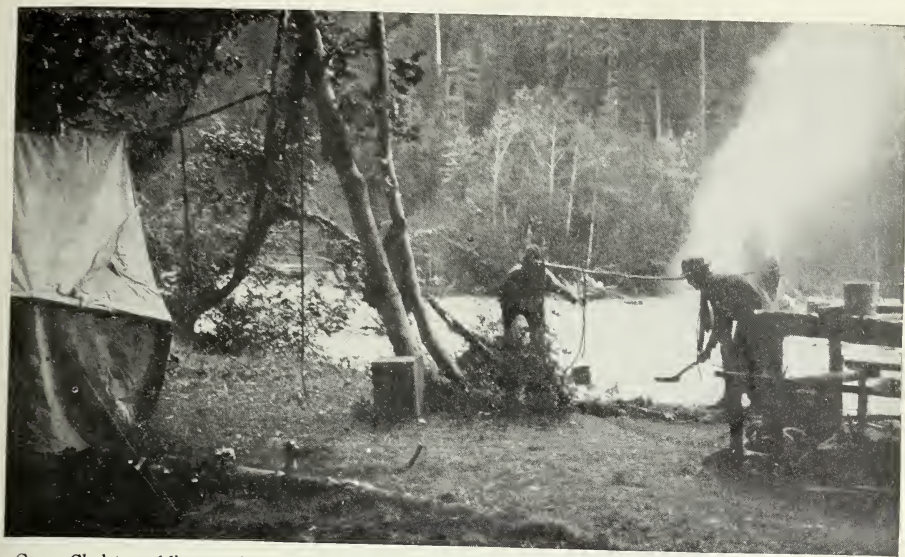
One may obtain a fish basket of any size or design, woven by one of the squaws. These Indian fish baskets can not be excelled in appearance or durability by any found in sporting-goods stores.

For the nature lover the headwaters of Suiattle River offer some very beautiful scenes. Glacier Peak, with its shining crown of ice, is justly noted for its beauty. The meadows and parks of Huckleberry Mountain are easily reached by horse trail and offer some of the finest camping places in the State. Ten days to three weeks are not too long to spend on this trip. Three days are required to go to the headwaters of the Suiattle from Sauk, and tourists should make several side trips of a day each before returning. Fuel and water are abundant and handy, and grass and pasturage for ponies are plentiful. A telephone line extends as far as the Suiattle Ranger Station, just above Buck Creek.

ILLABOT CREEK AND LAKE

Rockport is the logical starting point. One can go as far as the mouth of the creek by saddle horse or automobile. Packers, guides, and horses are available at Rockport. Fresh vegetables, milk, butter, and eggs may be obtained from farm-houses near the mouth of the creek.

If a short camping or fishing trip is desired, Illabot Creek is one of the best situated and most accessible places on the Washington National Forest. There are fine camping spots near the mouth of the creek, which enters the Skagit from



Camp Chalet—public camping grounds near the Olympic Ranger Station—Washington National Forest

the south, about 6 miles from Rockport. It also lends itself to long outings, since a trail leads 10 miles up the creek to Illabot Lake, where fishing is excellent.

The camp grounds at the lake are specially attractive in their setting of lofty snow-clad mountains and beautiful glaciers. All kinds of salmon and salt-water trout enter Illabot Creek to spawn, and a branch of the United States fish hatchery system of spawning sheds has been built at the mouth of the creek, where steelhead trout and salmon are caught to supply other hatcheries with eggs. It is an interesting sight to see the fish trapped and taken care of until they are ripe for spawning.

In the upper Skagit region Cedar Bar, Deer Park, and Ruby Creek offer excellent camping places from which attractive side trips may be taken. Good horse trails will be found nearly everywhere one wishes to go, and telephone lines are available in many parts of the Forest.

The Forest Supervisor's headquarters is in the Federal Building, Bellingham. Rangers are stationed at Darrington, Marblemount, Concrete, and Glacier

WENAHU NATIONAL FOREST

THE Wenaha National Forest occupies the most northerly spur of the Blue Mountains, which forms the divide between Grande Ronde River on the east and Walla Walla, Touchet, and Umatilla Rivers on the west. The main divide runs in a northeasterly and southwesterly direction, and can be traveled on horseback for its entire length, approximately 130 miles. Camping places, where good water and horse feed can be found, are numerous.

The elevations vary from 4,500 feet to 6,500 feet. The higher peaks are not abrupt, but mound-shaped and with more or less of a plateau on top. The highest of these is Oregon Buttes, 6,500 feet, with Mount Misery, 50 feet lower, a close second, and Mount Emily, 6,130 feet, third. The larger portion of the Forest is but lightly timbered. The south and east slopes are invariably open and covered with good stands of bunchgrass. The country is rather rugged, the ridges steep, and the canyons deep and narrow.

The gently-rolling cultivated hills surrounding the Forest form one of the best grain-growing sections of the Northwest. These grain fields, with their checkerboard effect, are a pleasing sight when viewed from the higher elevations of the main divide.

The Forest is traversed by 140 miles of road passable by automobiles and 568 miles of primary and secondary trails, which make every part of the Forest accessible for horseback trips.

Mule deer, black bear, brown bear, cats, coyotes, blue grouse, and pheasants are plentiful. Fishing is good in the numerous streams. Hunting and fishing are prohibited in approximately two townships of the northern portion of the Forest, which have been set aside as a county game preserve. Mule deer, elk, blue grouse, and pheasants are plentiful in this preserve. The deer and grouse scatter over the surrounding country, consequently good hunting can be had there during the open season. A herd of approximately 240 elk ranges in this vicinity. Protected by the law at all times, they are very tame. It is not uncommon to meet from 10 to 50 of them, and camera hunters are often able to secure pictures of bands of these splendid animals.

The Forest is accessible from the following railroad points on the Oregon-Washington Railway & Navigation Co.'s line: Asotin, Clarkston, Dayton, Pome-



The camera hunter takes a shot

roy, and Walla Walla, Wash.; and Pendleton, La Grande, Elgin, and Wallowa, Oreg. These places are also outfitting points, where supplies and pack outfits may be obtained.

Tollgate is a popular summer camping place. It is located on the divide and reached by the Woodward toll road. This road is the only one that crosses the Forest, and is the principal highway between Walla Walla and towns located in the Grande Ronde Valley. It is a fair automobile road and can be used during the summer months.

Godman Springs is another camping place accessible by automobiles. It is fair to become one of the most popular camp grounds on the Forest. It can be reached from Dayton, Wash., in an hour. It is expected that by 1921 a more direct route from Walla Walla will be completed, making Godman Springs accessible from the southwest. An automobile road along the summit of the Blue Mountains is now under construction. This will extend from Godman Springs south to Tollgate, on the old Woodward toll road, a distance of over 40 miles.

Bingham Hot Springs, 32 miles east of Pendleton, Oreg., on the Umatilla River, is easily reached by automobile from Walla Walla or Pendleton. The resort has hotel, dance hall, swimming tank, summer cottages, and camping grounds. Good fishing can be had near by on the Umatilla River and its tributaries. Bingham Hot Springs is 7 miles west of Gibbon, on the main line of the Oregon-Washington Railway & Navigation Co. An automobile stage meets the trains during the summer season.

The Wenaha River and its tributaries offer some of the best hunting and fishing on the Forest. Rainbow and Dolly Varden trout are plentiful at certain seasons. The best fishing is found at the most inaccessible places. Fishing and hunting parties can pack out of Troy, a small village with a hotel and store at the mouth of the Wenaha River. There is a good trail up the river and fair trails lead up its tributaries. Troy may be reached from Asotin, Wash., by a 50-mile drive, or from Wallowa, Oreg., by an automobile stage that leaves Wallowa Mondays, Wednesdays, and Fridays for Troy, returning the following day. The distance between Wallowa and Troy is 37 miles.

Asotin Creek, accessible by automobile from Asotin and Clarkston, is the favorite fishing stream. A road passable for motor cars extends about 12 miles up Asotin Creek to a pack trail about 8 miles beyond the road.

Tucannon River may be reached from Pomeroy or Starbuck by automobile and offers excellent fishing. There are numerous camp grounds along its banks.

The upper Touchet River can best be reached by automobile from Dayton, through which it flows. Passable roads extend some distance up its tributaries.

Mill Creek and Walla Walla River are the streams nearest Walla Walla. Roads along these streams extend nearly to the Forest boundary. The best fishing, however, is beyond the end of the roads and is reached only by horse or afoot.

Meacham Creek, along the main line of the Oregon-Washington Railway & Navigation Co., between Pendleton and La Grande, offers excellent fishing early in the summer. All the streams are stocked annually with fry furnished by State hatcheries.

The Forest Supervisor's headquarters is in the Federal Building, Pendleton, Oreg. Rangers' headquarters are at Dayton, Pomeroy, and Walla Walla, Wash., and La Grande, Oreg.

WENATCHEE NATIONAL FOREST

THE Wenatchee National Forest includes the mountainous portion of the watersheds of the Wenatchee, Entiat, Teanaway, Cle Elum, Kachess, and Upper Yakima Rivers, and Naneum and Swauk Creeks. It is roughly 70 miles long and 50 miles wide, extending from the summit of the Cascade Mountains to the breaks of the Columbia River, and from Glacier Peak to the Yakima River.

Water derived from the streams of this Forest irrigates about half a million acres of land in the Wenatchee, Kittitas, and Yakima Valleys.

The whole Wenatchee Forest is a great playground for the use of the people, with excellent hunting, fishing, and camping, and quiet resting places. Its lakes and streams, its quiet glens and sheltered nooks, its glaciers and meadows, its deep canyons and rugged peaks, offer the widest variety from which to choose a summer outing.

Within its boundaries are four large lakes—Wenatchee, Keechelus, Kachess, and Cle Elum—and hundreds of smaller ones, offering many opportunities for summer home sites and other recreation uses.

Mount Stuart, 9,470 feet in elevation, is the highest point within the boundaries of the Forest. Glacier Peak, 10,436 feet high, just outside its northern end, is most easily reached through this forest from Leavenworth.

Three transcontinental railroads—the Great Northern, Chicago, Milwaukee & St. Paul, and Northern Pacific—cross the forest. The Sunset Highway and Blewett Pass road furnish a beautiful automobile trip through it. Many other roads passable by automobile penetrate far into the heart of the forest, up the glacial valleys of the various streams, and to attractive camping places and summer-home sites.

The Government is spending thousands of dollars in this locality each year to protect the timber and other resources of this forest. It is public property which the Forest Service holds in trust. All are free to use the camping places, and are welcome to wood needed for camp fires, grass for horses, and to fish in the streams and hunt in the mountains in accordance with the game laws of the State. The Forest Service trails are open for your use. Its telephone lines may be used in case of sickness, accident, or other emergency. You can help the Forest Service by using them to report fires or other danger to the nearest ranger or to the supervisor, whose office is at Wenatchee, Wash.

The new road over Blewett Pass, which is nearing completion, has a maximum grade of 5 per cent and furnishes one of the most attractive and beautiful drives in the Northwest. This is a Forest road, built in cooperation by the Forest Service, the State of Washington, and Chelan and Kittitas Counties. An automobile tourist can easily make the trip from Seattle to Wenatchee by way of Snoqualmie and Blewett Passes in 12 hours. A fairly well-developed system of trails gives access to all parts of the Forest, so that foot or pack-horse trips may be taken in any direction.

Icicle Creek, which enters the Wenatchee River at Leavenworth, is a splendid trout stream, with a Forest Service trail extending from its mouth to its head. The Chiwawa River, another fine trout stream, is accessible by automobile from Leavenworth over a road which extends to its headwaters.

Tourists who enjoy wide vistas from the high points should visit some of the fire lookout stations which are accessible by trail. Tunwata Mountain, $4\frac{1}{2}$ miles north of Leavenworth, is reached most easily. Other lookout points on the Wenatchee are Dirtyface Peak, at Lake Wenatchee; Sugar Loaf Peak, at the summit of the Entiat Range; Tiptop, near the old mining town of Blewett; Redtop, on the Teanaway Ridge; Jolly Mountain, on the divide between the Middle Fork Teanaway and Cle Elum Valleys; and Mount Margaret, on the high ridge between Lakes Keechelus and Kachess.

Lake Keechelus is skirted from end to end by the Chicago, Milwaukee & St. Paul Railway on its west side and the Sunset Highway on its east side. Here are good fishing and hunting in season, beautiful camping places, and sites for summer homes. At Keechelus Inn and Sunset Tavern, each operating under a special-use permit, good meals and beds may be obtained by tourists; also repairs and supplies for automobiles. Huckleberries may be secured by climbing to the upper ridges. Lake Kachess has a hotel at its upper end, reached by a short road built in from the Sunset Highway.

A good automobile road extends from Cle Elum, through Roslyn, to Lake Cle Elum and on up the Cle Elum Valley to Salmon Lasac. From here Copper and Waptus Lakes may be reached on foot or horseback. These afford very fine sport, and the scenery about them is alone worth the trip. Fish and Hyas Lakes,



Forest and stream

at the head of the main fork of the Cle Elum River, are now closed to fishing under the State laws.

Another good automobile road extends from Leavenworth to Lake Wenatchee, 30 miles. Here there is a choice of two hotels or camping. A number of Cashmere and Wenatchee people have erected cottages at Lake Wenatchee, and a summer colony is developing. Horse feed can be secured from farmers; and milk, eggs, and fresh vegetables can usually be obtained during the recreation season. A fine soda spring, 8 miles up the Little Wenatchee River, above the head of the lake, is accessible by a trail which continues on to the head of the river, at Cady Pass. The fishing along this stream is good, and berries are plentiful.

The Forest Service has laid out lots at Lake Kecheelus, Lake Kachess, and Cle Elum Lake for summer-home sites. These lots are accessible by automobile, road and railroad, and are near attractive recreation features, such as boating, fishing, swimming, camping, and mountain climbing. The fresh mountain air,



A mantle of timber

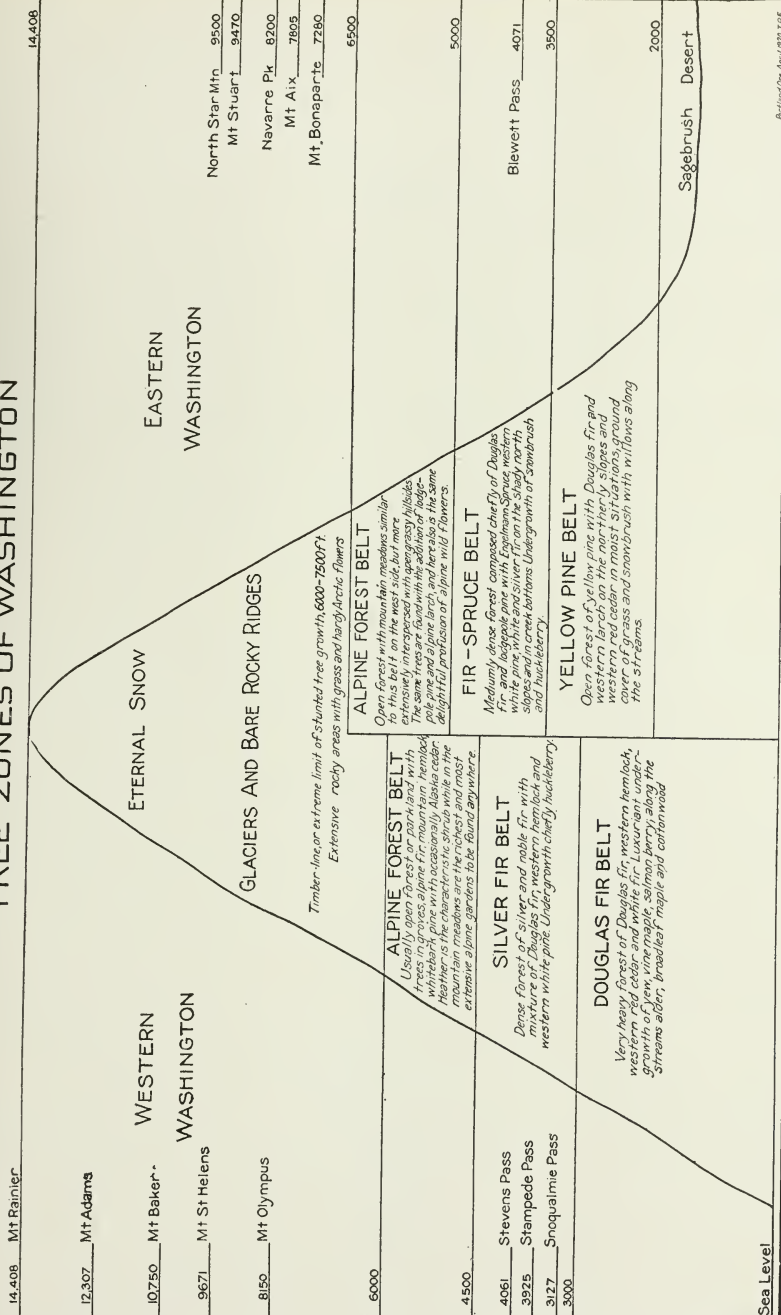
pure water, and healthful surroundings are all conducive to renewed health and vigor. Care with fire and proper sanitation are the only restrictions. Smaller tracts have been platted elsewhere, and as a rule isolated areas may be rented if desired.

The Rocky Run public camp ground, on the Sunset Highway at Lake Keechelus, is a popular stopping place for touring parties. Along the road horse feed can usually be found wherever night overtakes the traveler, except on the Little Wenatchee, White, and Cle Elum Rivers, where it is necessary to go well toward the head of the streams before grass is found in abundance.

The Silver Creek camp ground, at the end of the road up the Entiat Valley, has become very popular with local people because of its beauty and convenience, the attractiveness of the trip, and the good fishing in its vicinity. About 3,000 people registered there during 1919.

Headquarters of the Forest Supervisor is Post Office Building, Wenatchee, Washington. Rangers are stationed at Leavenworth, Easton, Liberty, Telma, and Chiwaukum.

TREE ZONES OF WASHINGTON



OUTFIT AND CLOTHING SUGGESTIONS

Suit: Preferably of some strong material, such as khaki, whipcord, or overall.

Mackinaw or sweater.

Medium-weight underwear.

Socks: Two pairs medium weight or one pair heavy.

Shirt: Flannel or khaki, light or medium weight.

Shoes: Stout, easy, with heavy soles.

Boots.

Leggings: Canvas or leather if shoes are worn instead of boots.

Buckskin gloves.

Beds: Air beds are comfortable where they can be carried, since they can be placed even bare rocks.

Bedding: The most serviceable is a quilt of eiderdown or wool with an extra covering of denim. The quilt can be sewed or pinned with blanket pins along the bottom to form a sleeping bag. If blankets are chosen it should be borne in mind that two light ones are warmer than a single heavy one.

A 7 by 7 foot, 10-ounce canvas, when folded, will make a ground cloth and an extra cover and is also useful as a pack cover. The Army "shelter half" is preferred by some.

FOOD SUPPLIES

The following list prepared in the Forest Service may be used as a guide in purchasing food supplies. The weights listed are for one man for one day. The amounts for a party for any length of time can easily be computed.

All weights are net (i. e., weight of contents exclusive of containers):

COMBINATION RATION LIST—ONE MAN ONE DAY

Balanced ration, one man one day.	Quantity.	Weight in pounds.	Equivalent substitutes.	Quantity.	Weight in pounds.
Beef, fresh.....		1. 25	Mutton or pork, fresh, or venison.....	1. 25	1. 25
			Bacon.....	. 6	. 6
			Ham.....	. 8	. 8
			Canned meat.....	1. 0	1. 0
			Canned fish.....	1. 0	1. 0
			Dried fish.....	. 9	. 9
			Eggs.....	¾ doz..	1. 50
			Fowls or game birds, dressed...	1. 50	1. 50
			Fresh fish, cleaned.....	2. 0	2. 0
			Cheese.....	. 6	. 6
			Peanuts (with shells).....	. 7	. 7

COMBINATION RATION LIST—ONE MAN ONE DAY—Continued

Balanced ration, one man one day.	Quantity.	Weight in pounds.	Equivalent substitutes.	Quantity.	Weight in pounds.
Cheese.....		0.06	{ Meat, fresh.....		0.12
			{ Sweet chocolate.....		.06
Beans.....		.2	{ Dried peas, lentils, etc.....		.2
			{ Rice or hominy.....		.2
			{ Baked beans, canned.....		.5
			{ Bread, baker's.....		1.0
			{ Pancake flour.....		.8
Flour.....		.8	{ Hard-tack or pilot bread.....		.7
			{ Crackers.....		.75
			{ Corn meal.....		.8
			{ Macaroni, spaghetti, etc.....		.7
Baking powder.....	$\frac{3}{4}$ oz....	.048	{ Dry yeast (for yeast bread).....	$\frac{1}{4}$ cake..	.012
			{ Soda (for sour dough).....	2 oz.....	.012
Oat meal.....		.15	{ Cream of wheat, corn meal, etc.....		.17
			{ Grape nuts, corn flakes, etc.....		.17
Potatoes, fresh.....		.8	{ Dried potatoes (evaporated)....		.15
			{ Dried beans, lentils, peas, etc.....		.2
			{ Rice or hominy.....		.2
Fresh vegetables (as- sorted) (o n i o n s , turnips, beets, cab- bage, etc.).		.45	{ Canned peas or corn.....	$\frac{1}{4}$ can..	.31
			{ Canned tomatoes.....	$\frac{1}{4}$ can..	.47
			{ Dried or desiccated vegetables.....		.25
			{ Potatoes (added to staple al- lowance).....		.40
			{ Dried apples.....		.15
			{ Raisins or currants.....		.15
Fruit (dried).....		.25	{ Dried peaches, figs, or apricots.....		.2
			{ Canned fruit.....	$\frac{1}{3}$ can..	.65
			{ Jam.....		.2
			{ Fresh fruit.....		.8
Coffee (ground, or sol- uble coffee).		.13	{ Tea.....	$\frac{1}{2}$ oz....	.03
			{ Chocolate or cocoa.....		.08
			{ Lemons.....	$\frac{1}{4}$ doz..	.65

COMBINATION RATION LIST—ONE MAN ONE DAY—Continued

Balanced ration, one man one day.	Quantity.	Weight in pounds.	Equivalent substitutes.	Quantity.	Weight in pounds.
Sugar (if no dried fruit is used, allowance may be reduced to 0.2 pound).	.....	0.35	.....	.....	.....
Sirup ¹	$\frac{1}{2}$ pt....	.08	{ Molasses.....	$\frac{1}{2}$ pt....	0.07
			{ Honey.....	.....	.08
			{ Sugar (white or brown).....	.....	.05
Milk (evaporated).....	{ Can, $\frac{1}{3}$ pt. }	.33	{ Fresh milk.....	$\frac{2}{3}$ pt....	.66
			{ Condensed milk.....	$\frac{1}{3}$ pt....	.2
Butter.....	.....	.13	{ Peanut butter.....	.....	.13
			{ Oleomargarine.....	.....	.13
			{ Lard substitutes.....	.....	.10
Lard.....	.....	.10	{ Bacon grease (can be saved if bacon is substituted for fresh meat). .....	.....	.10
Salt.....	$\frac{2}{3}$ oz....	.04			
Pepper, black.....	$\frac{1}{17}$ oz....	.004	Red pepper.....	$\frac{5}{16}$ oz....	.003
Pickles ¹	$\frac{1}{17}$ pt....	.05	Vinegar.....	$\frac{2}{5}$ pt....	.04
			{ Ginger.....	$\frac{1}{5}$ oz....	.003
Spices (cinnamon) ¹	$\frac{1}{25}$ oz....	.003	{ Nutmeg.....	$\frac{1}{5}$ oz....	.003
			{ Cloves.....	$\frac{1}{5}$ oz....	.003
			{ Mustard.....	$\frac{1}{5}$ oz....	.003
Flavoring extract (vanilla). ¹	0.03 oz.	.002	Lemon.....	0.03 oz.	.002
Cornstarch ¹.....	.....	.2	Tapioca.....	.....	.02
Bouillon cubes.....	0.1 oz.	.....	{ Maggi soups.....	$\frac{1}{2}$ pkg.	.05
			{ Canned soups.....	$\frac{1}{4}$ can..	.25
Total weight, 5.223. ²					

¹ Suggestive rather than essential: their use may be governed largely by individual taste, size of party, and duration of trip.

² A much lighter ration can be made up by substituting the more concentrated foods within each class. As a rule, rations made up entirely of the most concentrated foods should be avoided.

Suggested accessories are soap, dish towels, hand towels, matches, candles, paper bags for lunches, and cloth bags for sugar, rice, beans, etc.

The following table has been prepared by the Forest Service and will serve as a handy reference and guide for campers. The needs of two, four, six, or eight persons are separately provided for.

Column A indicates a complete equipment, all that would be considered necessary and convenient for a stay of a month or more; or in case transportation is not restricted as to weight.

Column B indicates an average equipment which will serve the purpose very handsomely for a week or 10 days, and will do for a longer stay. It is suitable for a pack-horse trip.

Column C indicates a minimum equipment, one that is really insufficient to meet the ordinary needs of a camping party, but which will suffice for a short stay and very simple cooking. It is such an outfit as a party of practical woodsmen might take and get along with in case the packing facilities were very limited as to weight, such as a man-pack trip.

COOKING AND MESS EQUIPMENT FOR VARIOUS-SIZED CAMPS UNDER VARYING CONDITIONS

Item.	For 2 men.			For 4 men.			For 6 men.			For 8 men.		
	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.
COOKING EQUIPMENT.												
Cooking pails: ¹												
2-quart.			I									
3-quart.	I	I	I			I						
4-quart.	2	I	I	I	I	I			I			
5-quart.	I	I		I	I	I	I	I	I			
6-quart.		I		I	I	I	I	I	I	I	I	I
7-quart.				I			I			I	I	I
8-quart.	I				I		I	I	I		I	
9-quart.										I		I
10-quart.				I			I	I		I	I	I
12-quart.										I	I	I
14-quart.										I		
Frying pan ² No. 2 (9-inch diameter).	2	2	2									

¹ It is desirable to have pails of nesting sizes. At least one medium-sized pail of enamel or aluminum ware is recommended for cooking fruits. Stew kettles with bails may be substituted for pails, but usually do not nest as conveniently.

² Frying pans with detachable handles are more convenient for packing.

COOKING AND MESS EQUIPMENT FOR VARIOUS-SIZED CAMPS UNDER VARYING CONDITIONS—CONTINUED

Item.	For 2 men.			For 4 men.			For 6 men.			For 8 men.		
	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.
COOKING EQUIPMENT—Continued.												
Frying pan ¹ No. 5 (11-inch diameter).....				2	2	2						
Frying pan ¹ No. 6 (12-inch diameter).....							2	2	3	1		
Frying pan ¹ No. 7 (13-inch diameter).....										2	2	
Extra fry pan, reflector, Dutch oven, or stove ²	I			I	I		I	I		I	I	
Coffee pot, ³ 2½ quarts.....	I	I										
Coffee pot, ³ 3 quarts.....				I	I							
Coffee pot, ³ 5 quarts.....							I	I				
Coffee pot, ³ 6 quarts.....										I	I	
Butcher knives ⁴	I	I		I	I	I	2	2	I	2	2	
Paring knives ⁴	I	I		I	I	I	I	I	I	I	I	
Stirring spoons.....	I	I		2	2	I	2	I	I	2	2	
Meat fork.....				I			I	I		I	I	
Can opener ⁴	I	I		I	I	I	I	I	I	I	I	
Dish pan (use milk pans for small parties).....	I			I	I		I	I		I	I	
Wash basin ⁵	I	I		I	I		2	I		2	1	
Mixing pan.....	I			I	I		I	I		I	I	
Bread board ⁶				I			I	I		I	I	
Rolling pin ⁷				I			I			I		
Egg beater.....							I			I		
Pancake turner.....				I			I			I		
MESS EQUIPMENT.												
Plates.....	6	4	2	8	7	6	12	10	8	12	12	1
Cups.....	4	3	2	6	5	5	8	8	7	10	10	
Saucers.....	3			5			8			10	2	

¹ Frying pan, with detachable handles are more convenient for packing.

² The choice of an extra fry pan, reflector, Dutch oven, or stove for baking can best be made by the camper. If reflector or stove is to be used, bread pans of proper dimensions must be added to the list.

³ Pails of similar size are frequently a desirable substitute, as they will usually nest better with the rest of the outfit.

⁴ A jackknife may cover all needs.

⁵ A pudding pan is a possible substitute and nests better.

⁶ Canvas tacked onto box siding or shakes makes a fair substitute and may save from 6 to 8 pounds in weight.

⁷ A pint or quart bottle makes an excellent substitute.

COOKING AND MESS EQUIPMENT FOR VARIOUS-SIZED CAMPS UNDER VARYING CONDITIONS—CON.

Item.	For 2 men.			For 4 men.			For 6 men.			For 8 men.		
	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.	Col. A.	Col. B.	Col. C.
MESS EQUIPMENT—Continued.												
Bowls.....	3			5			8			10	8	
Knives.....	4	3	2	7	6	5	9	8	7	12	10	9
Forks.....	3	3	2	5	5	4	8	7	6	10	10	9
Spoons, tea.....	3	1		5			7			10	8	
Spoons, dessert.....	2	2	2	6	6	5	8	8	7	10	10	10
Spoons, table.....	2	2		3	2	1	3	3	1	4	2	1
Pans (serving dishes), 2 quarts.....	2	2	1	1	1	1	2	1	1			
Pans (serving dishes), 3 quarts.....	1			2	2	1	2	3	2	3	3	2
Pans (serving dishes), 4 quarts.....				1			2	1		4	3	2
Pitchers, milk.....				1			1			1		
Pitchers, sirup.....				1			1			1		
Salt and pepper shakers.....	1			1			1	1		2	2	
Approximate weight, ¹ pounds.....	20	13½	7	35	21	13	43	34	19½	62	46	30

¹ Weights figured on basis of using "extra fry pan" instead of reflector or stove and using moderately heavy tin for all containers except one medium-sized pail and from one to three pans in enamel ware. Total weight would be increased about one-fourth by using all enamel ware; by using aluminum, it may be reduced about one-third.

Accessories which may be added are: Wire, or light chains with hooks for hanging pots; oilcloth for table; 1 canvas water bucket (weight $\frac{3}{4}$ to 1 pound).

Miscellaneous camp equipment to be selected according to needs: Shovel, ax or hatchet, assorted nails, lantern, can-
teens, 6-inch files, whetstone, rope, twine.

CAMP COOKERY

COOKING FIRE FOR A SMALL CAMP¹

There are many ways of building the cooking fire. The essential in each case, however, is a good permanent draft; but do not build the fire against a log or a tree or in a place where it may spread. The draft may be secured best by the method usually employed in sheep camps. The site is chosen and an excavation is made, the soil being removed to a depth of 12 inches, or approximately the depth of the shovel. The hole thus made should be at least 3 or 4 feet in width. The side

¹ A portion of the suggestions on cooking and of the recipes is taken from Bulletin 76, "Camp Cookery," of the Oregon Agricultural College.

exposed to the prevailing wind is then shoveled away, allowing the free entrance of air. This opening is the front of the cooking fire. The air going in passes along the side walls to the rear and thence upward, thus perfecting the draft. Select two green poles of sufficient length to extend over the ends of the hole (4 to 6 inches in diameter), one to serve as a back log, the other as a front log. Lay the poles over the hole, spacing them the proper distance to support a camp kettle, frying pan, or coffee pot. Kindle the fire beneath and proceed with the cooking. The poles can be replaced from day to day as they burn away.

When cooking frying-pan bread by reflected heat, usually a dry front pole is preferred to a green one, because the drier pole, being somewhat charred, combines with the hot coals beneath to produce a greater amount of reflected heat.

Be sure to clear away all dead twigs, leaves, or other combustible material for a distance of 6 feet to the fresh mineral soil.

CRANE FOR CAMP KETTLE

In constructing a crane for camp kettles the height of the pole should be approximately shoulder high. The kettles should be suspended by pothooks made from small, tough saplings, trimmed to leave a projecting fork to suspend the kettle from the crane, and having at the other end a notch cut or small nail driven in at an angle to hold the kettle bail. No. 9 wire is also good for the purpose. The hook may then be grasped at a sufficient height above the fire to prevent burning the hands. By having pothooks of different lengths the desired intensity of heat can be secured by regulating the distance of the pot from the fire.

DUTCH OVENS

In using Dutch ovens, care should be taken that the oven and lid are quite hot enough before the dough is placed in them for baking. During the preparations for baking, the oven and lid should be heated over the fire. When a good mass of coals has been obtained, the dough should be placed in the heated oven (the bottom having been greased) and the lid put on. The oven should then be embedded in the coals and the lid covered with coals and hot ashes.

Instead of a Dutch oven two pans may be used, one large enough to fit snugly over the other as a cover. Plenty of ashes and earth should be piled on top or the bread will burn.

RECIPES

COFFEE.—Bring water to boiling point; add coffee, one level teaspoonful for each cup of water used, keep in a warm place for five minutes but do not allow to boil. Settle and serve. The coffee may be put in a small muslin bag tied loosely and the bag of grounds removed before serving.

SOLUBLE COFFEE.—Put one-half teaspoon (more or less, according to strength desired) in a cup and add boiling water.

ARMY BREAD.—

1 quart flour.

1 teaspoon salt.

1 tablespoon sugar.

4 teaspoons baking powder.

Mix the ingredients thoroughly and stir in enough cold water (about one and one-third pints) to make a thick batter. Mix rapidly with a spoon until smooth and pour out at once into a Dutch oven or baking pan. Bake about 45 minutes, or until no dough adheres to a sliver stuck into the loaf.

FRYING-PAN BREAD.—

1 cup flour.

1 teaspoon salt.

1 tablespoon sugar.

3 teaspoons baking powder.

Mix and add enough water to make a thick dough. Pour into well-greased, hot pan and set flat near the fire. In a few minutes it will rise and stiffen. Prop the pan nearly perpendicular before the blaze; when brown on one side, turn over. A clean silver fork stuck through the center of the loaf will come out clean if the bread is sufficiently baked.

FRYING.—Rake a thin layer of coals out in front of the fire; or for a quick meal make the fire of small, dry sticks and fry over the quickly formed coals.

If a deep pan and plenty of frying fat are available, it is best to immerse the material completely in boiling grease as doughnuts are fried. Let the fat heat until little jets of smoke arise (being careful not to burn the grease), then quickly drop in small pieces of the material, one at a time so as not to check the heat, turn them occasionally while cooking. Remove when done and place on a coarse paper that will absorb surplus fat. The above method is an excellent way to cook small fish.

When only shallow pans and little grease are available, to fry (or, properly, to broil) in this manner without getting the article grease-cooked, heat the dry pan very hot and then add just enough grease to keep the meat from sticking (fat meat

needs none). The material should be dry when put into the pan or it will absorb grease. Cook quickly and turn frequently. Season when done and serve hot.

STEWING.—Stewing is a very desirable way of cooking coarse and tough pieces of meat. Put the meat cut into small cubes into a hot frying pan. Let it brown, add a small quantity of sugar, if desired, and sliced onions. Cook until the onions are tender, then pour the contents of the frying pan into the stew pan, and add enough boiling water to cover the meat and let it simmer gently for two or three hours. Flavor with salt, pepper, herbs, or curry powder. This dish may be thickened with browned flour, and vegetables may be added—turnips, carrots, etc., cut into small pieces and browned with the meat.

BOILED RICE.—Wash the rice well and sprinkle into a kettle of salted water, boiling hard all the time. After 15 or 20 minutes, or until a grain feels soft when pressed between the thumb and finger, pour off the water and place the kettle near the fire so that the grains may dry and swell. If cooked longer the rice is likely to become pasty.

CANNED GOODS.—Before using canned goods see that the ends of the cans are sunk in. If the ends are swelled or bulgy it usually means fermented contents and spoiled goods. After a can has been opened pour contents immediately into enameled ware dish. Never leave food in the original cans.

DRIED OR EVAPORATED FRUIT.—Wash and pick over the fruit, soak over night in the water (cold) it is to be cooked in, using only enough water to cover the fruit. Simmer from 2 to 3 hours; sweeten before removing from fire. Do not use an iron vessel, or permit the fruit to boil hard. Keep closely covered.

SIMPLE DESSERTS

Simple desserts, such as boiled rice served with stewed fruit, or rice cooked with evaporated milk, diluted, and mixed half and half with well-sweetened apple sauce made from evaporated apples, add considerable variety without calling for additional supplies or much extra work. A shortcake could be made with stewed fruit or hot apple sauce, using for the cake the recipe for frying-pan bread. For change nut bread could be made by adding some broken-up nut meats to the bread dough, or cinnamon buns could be made by adding raisins cut small and spreading sugar and cinnamon over the top before baking.

DISPOSAL OF REFUSE

Burn all cooking refuse in the camp fire; it will not affect the cooking. Burn everything—coffee grounds, parings, bones, meat, even old tin cans—for if thrown out anywhere, even buried, they will attract flies. Refuse once burned will not attract flies.

If burning is impracticable, dig a hole for the refuse, leaving the earth piled up on the edge, and cover every addition with a layer of dirt.

PACKING

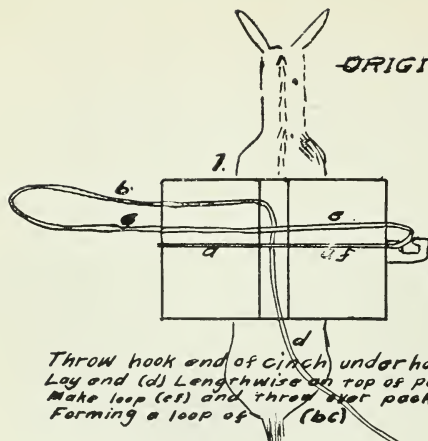
The pack saddle is firmly cinched; the portions of the outfit are carefully suspended upon it; and the whole is secured by a rope with a single hitch, which is so tied as to bind the load to the animal. The usual pack saddle is of the sawbuck type, as shown in the illustrations on page 69. Care should be taken in saddling the animal. Too many blankets are as bad as not enough, for either cause a sore back. The blanket should be rinsed out in cold water and hung up to dry without wringing. If dried in this manner and carefully folded, it can be kept from wrinkling without much difficulty. The horse's withers should be examined after the saddle is cinched; and if the forks of the saddle are not free, more blankets should be used on the side of the horse under the bottom of the saddle. A single-cinch saddle with breeching and breast straps is preferred, although double-cinch saddles are used. The saddle should be kept tightly in place and evenly balanced.

In figure 10 are shown two canvas pads with leather corners, filled with grass, and cross ribs to support the canvas. Figure 9 shows the underside of this pad and the leather-bound holes in the center for placing over the horns of the saddle. Figure 8 shows the outside of this pad with hardwood rib on each side. If a little care is taken in placing fresh hay in these pads from time to time, sore ribs on pack animals may be prevented. The pads make an excellent protection for the horse in packing supplies in boxes, etc. Bear or elk grass is preferred for filling.

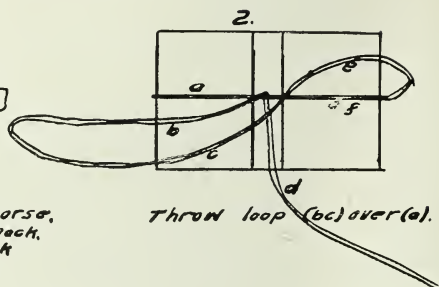
The rope shown in figure 10 is known as the sling rope and is only to be used where alforjas are not available. Figure 11 shows the sawbuck pack-saddle rigged with these sling ropes without the canvas pads. Figure 12 shows how such a sling should be tied. Two half hitches are taken in the middle of the sling rope and roped over the front crosstree. The ends are then looped over the rear crosstree

ORIGINAL DIAMOND HITCH

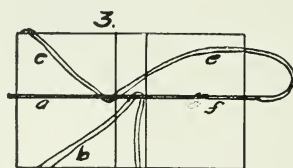
Cy J. Bingham



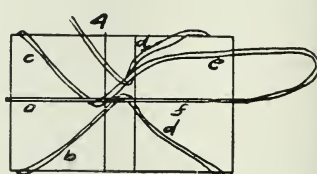
Throw hook end of cinch under horse. Lay end (d) lengthwise on top of pack. Make loop (ef) and throw over pack forming a loop of (bc)



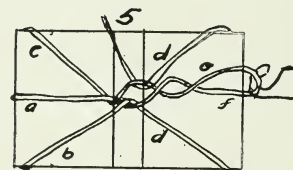
Throw loop (bc) over (a).



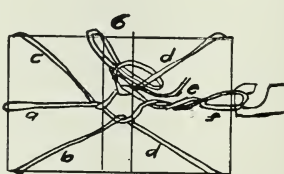
Throw (c) over (b) and under (e) and form loop around left after



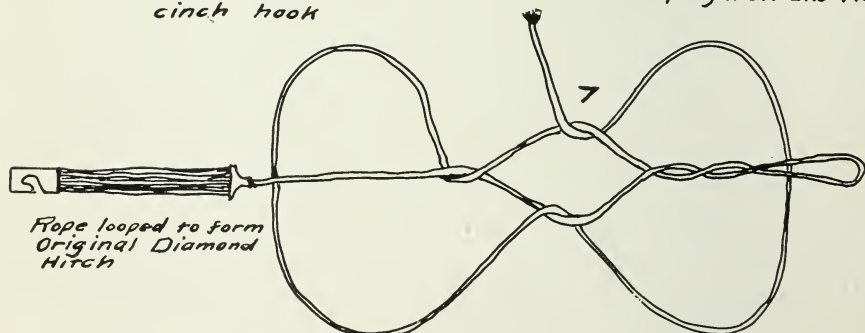
Carry end (d) under right side of pack and thread under (e) on top of pack.



Twist (ef) and hook in cinch hook



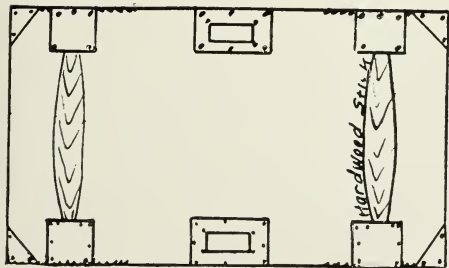
Cinch, tighten and tie



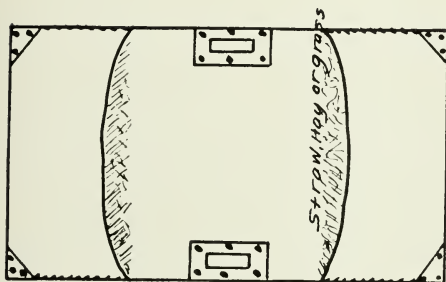
Rope looped to form Original Diamond Hitch

Figures illustrating details of the diamond hitch.

8

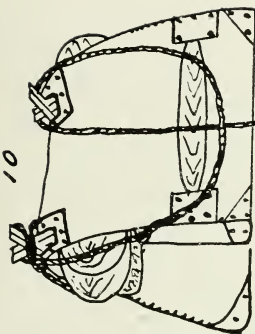


9



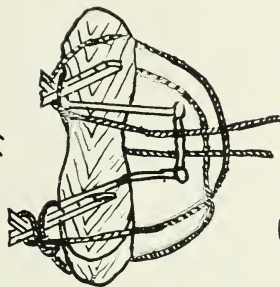
Upper Side of Canvas , Under Side of Canvas . Pad

10



Sawbuck Saddle Equipped With Canvas Pad and Slings Ready for Packing

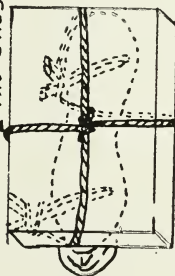
11



Sawbuck Saddle With detail of Slings

12

Two ends drawn tightly together and tied



Box Slung to Sawbuck Saddle by Sling

Figures illustrating pack saddle of the sawbuck type.

to form the slings from which the packs are hung. The sling is adjusted to the proper position, and when both side packs have been slung the ends of the sling rope are tied together across the center of the saddle.

Too much care can not be used in arranging the pack before loading it on the animal. The side packs should be as evenly balanced as possible, either in alforja or boxes. They should hang well down on the sides and not up on the back of the pack animal. Light stuff, such as bedding, camping utensils, etc., may be placed on top, but be sure that the bulk of the load is well down on the side, as this has a tendency to give the animal more perfect control of the load in making a quick move such as jumping logs or ravines. If the load is all on top, the animal, no matter how quiet and careful, is bound to hurt its back from the free-pivot swing of the saddle and load.

The original diamond hitch, as shown in figure 7, on page 68, may be thrown by one or two persons. When loosened and taken from the horse there are no knots or tangles to be taken out of the rope. The load may be tightened in a few seconds when one has had a little practice. Figure 1 shows the first move to be made with the rope. If one person is packing, he should stand on the off side of the horse to start. If there are two persons, the one on the near side is the one to start the operation. Figure 2 shows the position of the rope after it has been hooked. Figure 3 shows the position of the rope after it is placed under the corner of the alforja or pocket. Figure 4 shows how it looks on both sides. Figure 5 shows the rope as tightened, while figure 6 shows the rope tightened and made fast.

FISH AND GAME PROTECTION

The heavily timbered areas of Washington are the natural game sanctuaries of the State. These areas are largely within the National Forests, and are subject to the protection which goes with true forest conservation, which insures to the sportsman and the public in general not only good hunting grounds but a permanent supply of wild game. The fish and game laws applying in the National Forests are those enacted by the Washington State Legislature. Every hunter and fisherman should familiarize himself with these laws, a copy of which will be furnished by the State game warden at Seattle, Wash.

Game and fish protective work is one of the regular official duties of all Forest officers, who are ex officio State game wardens.

A new regulation has recently been approved by the Secretary of Agriculture, which provides:

"The going or being upon any land of the United States, or in or on the waters thereof, within a National Forest, with intent to hunt, catch, trap, willfully disturb, or kill any kind of game animal, game or nongame bird or fish, or to take the eggs of any such bird, in violation of the laws of the State in which such land or waters are situated is hereby prohibited."

HANDLING KILLED DEER

There are several ways of carrying a deer after killing. The following method is one used by a great many experienced hunters: After removing entrails, cut the skin around the legs close to the hoofs below the dewclaws, then split the skin of the leg to above the knee joint. Cut legs off at knee joint and skin out, then tie skin of legs together by tying skin of right foreleg to skin of left hind leg and vice versa. Then place the deer on a log or upper hillside, run arms through loops formed by tying legs, get them well up on the shoulders and rise. The deer will then hang crosswise on the back. The pack can be regulated for comfort by lengthening or shortening the leg ties.

For packing one deer on a horse the following will be found very simple: Take a small rope, place double half hitch over horn of saddle, place deer on it, belly down (and it is best to turn the legs slightly to the rear) and let the weight rest just back of the forelegs. Take a half hitch around flank with hitch underneath, then pass rope through cinch ring. Repeat on opposite side, putting hitch just back of forelegs. Balance the deer in saddle, tighten the ropes, and fasten them. The head and horns can be twisted around and tied to the horn of the saddle.

To skin a deer, swing it clear of the ground by the hind feet and then skin down. By this means the hide can be nearly pulled from the carcass after it has been started with a knife here and there, and the meat kept clean. To preserve the hide, stretch it over a log, a tree, or on the side of a building, flesh side out, until it is thoroughly dried, then it will keep and is easily packed.

If it is desired to preserve the head for mounting, the following simple method is satisfactory. Never cut the animal's throat if you wish to mount the head. If it is desired to bleed him, stick a knife in the breast at the base of the neck. To remove the skin from the head and neck, first slit the skin from one horn to the other

and carry the cut around the base of each horn. Then from the middle of the cro cut, carry a cut down the middle line of back of neck. The hide can then be removed from the head. Use common table salt to preserve the scalp. Lay the skin flat side up and rub plenty of salt into all parts of it. Be careful to put plenty behind the ear cartilages and around the nose.

One of the hardest problems which confront the hunter after killing his deer is taking care of the meat, especially in hot weather when the flies are bad. It is a good idea to take two or three sacks along made from house lining or cheesecloth. These sacks should be made about 6 feet long by 2 feet wide. The hunter can carry one of these bags along when hunting. If a deer is killed, remove the entrails, hang it up so it will drain, and slip the bag over it; fasten it so flies can not get in. A deer can be left hanging in this manner and brought to camp on a horse later. The same method should be adopted after the deer has been skinned in camp. Late in the season when the nights are cool, by keeping flies off in this manner, a deer can be kept fresh for several days, and in some cases for a week or two.

Nearly every hunter has his own ideas about making "jerky." The meat should be cut into strips from 2 to 3 inches thick and dipped in boiling hot brine. Build a rack with long sticks (wire screen is better), smoke with green maple or other hardwood until the meat is seared over so flies will not bother. After that it is best to dry it in the sun as much as possible. When smoking, do not allow the fire to blaze or the meat will be cooked instead of jerked.

CODE OF LOST AND DISTRESS SIGNALS

When a man is lost or injured and needs help, a signal by shooting should be given. The lost and injured signal is the firing of a gun twice, with an interval of 10 seconds between and one single shot 60 seconds later. If no answer is received, this signal should be repeated after an intermission of 5 minutes. The answer to this signal will be one single shot from the rescuing party, followed by a recognition shot from the lost man.

Care should be taken to get the time between shots as accurate as possible. In the absence of a watch the time can be very accurately judged by counting 10 between the first and second shots and 60 between the second and third shots. Hunters should keep in mind this signal and, if possible, avoid giving it when shooting at game.

The person who is lost should, after hearing an answer to his signal, remain at the place where he gave the signal until the rescuing party arrives; otherwise he may take the opposite direction and not be found at all.

To prepare for an emergency, every hunter or fisherman should carry in his pocket a piece of candle and matches in a water-tight match safe, so that, in case he should get lost or injured, he can readily start a camp fire.

ACCIDENTS

Preliminary treatment is described for the following more common accidents:

DROWNING.—Remove clothing from upper part of body. Lay patient face down and empty lungs of water by lifting the body by the middle. Then place the patient on his back. Put your finger well back in his throat and clear out mud, leaves, etc. Pull and hold tongue forward with dry handkerchief. To induce artificial respiration kneel at the patient's head and grasp arms below the elbow. Alternately raise both arms upward and backward over the head, making the elbows almost touch the ground; then bring them down again, pressing them against the sides and front of chest. Repeat about 15 times a minute, and continue for at least an hour and a half. As soon as natural breathing begins, give stimulants and warm drinks by teaspoonfuls.

WOUNDS.—Reduce the flow of blood by applying cold water, snow, ice, or poultice; also by elevation of the part injured. If an artery is cut so that the blood spurts in jets, stop flow of blood by pressing against bone or muscle. If injury is to limb, tie band tightly around it near the wound and between the wound and the heart.

SUNSTROKE.—Get patient in shade at once. Lay him on his back and apply cold water to head and neck. Do everything possible to reduce temperature of body and rapidity of pulse.

MAD-DOG OR SNAKE BITE.—Apply a tourniquet between the wound and heart, loosening it from time to time. Suck wound, but be sure you have no open cuts or sores on lips or mouth. In snake bite a heart stimulant should be administered. A good treatment consists of hypodermic injections of potassium permanganate near the puncture; also give strychnine hypodermically or in tablets to keep up heart action.

PTOMAINÉ POISONING.—Ptomaines are a common source of poisoning and most frequently occur in canned meats, fish, etc. An effort must be made at once to empty the stomach by vomiting, which may be induced by tickling the throat with feather or finger, or drinking warm water with mustard. Laxatives, such as Epsom or Rochelle salts or castor oil, should be given freely. Stimulants should be given and heat and rubbing applied after the elimination of the poison.

ADMINISTRATION OF THE NATIONAL FORESTS

Simplicity is the principal characteristic of the Forest Service organization. No red tape is allowed to interfere with the efficiency of the men in the field. Each National Forest is in direct charge of a forest supervisor, with headquarters in a town conveniently near the Forest, and is divided into ranger districts, each in charge of a forest ranger. A large part of the business of the Forest can be carried on with the rangers, and most of the rest with the forest supervisors. The larger questions of policy and administration are referred to the district forester.

The timber that is mature and ready for cutting is offered for sale to the highest bidder. When a sale is made, the trees to be cut are marked by a Forest officer, provision being made for the preservation of the young growth and the perpetuation of the Forest. The purchaser of National Forest timber is required to dispose of the logging slash in such a way as to prevent its becoming a fire menace.

As the result of great forest fires there are here and there on the National Forests large burns which are completely deforested and which can be reclaimed only by the artificial planting or sowing of small trees. Such areas the Forest Service is reclaiming by planting young trees grown in the Service nurseries. About 1,500,000 small trees are planted annually in the National Forests of Washington.

On most of the National Forests there are areas suitable for the grazing of sheep or cattle. These are allotted to the sheep and cattle men for a regular fee of so much per head of stock. On the open forests of eastern Washington, where there are large areas of bunch grass in the yellow pine timber, sheep and cattle are grazed under Forest Service permit and supervision. The nutritious forage is thus utilized for the production of meat, wool, and hides, and the danger from fires spreading in the forests is thus greatly reduced.

Settlers who live within or near a Forest are allowed to graze a small number of domestic stock free of charge. Care is taken to see that each settler and stockman gets his fair allotment of range, and that the range is not overgrazed and spoiled for the next grazing season.

The greatest menace to the forest is fire, and the Federal Government spends annually on the National Forests of Washington about \$60,000 for patrol work and from \$5,000 to \$80,000 for actual fire fighting. On each of the Forests in Washington there are one or more lookouts who are stationed on the higher peaks and ridges. Upon these the Forest Service depends for the speedy discovery of fires. It is intended that all parts of every Forest shall be under constant observation during the summer season. The lookout is housed in a small cabin and provided with field glasses and instruments for determining the location of fires. Telephone lines enable him to report the fire to the district ranger. Once a fire is discovered and located, it is the business of the ranger to put it out. Tools are always ready at the ranger stations and in special boxes at strategic points in the Forest. The ranger and his assistants are always ready for prompt action, and the majority of fires are reached and extinguished inexpensively by a small crew before they spread to large proportions. If the fire is too large for the ranger to handle, the Forest supervisor takes charge and by means of plans made in advance is able to secure on short notice experienced crews of fire fighters, transportation, and large supplies of tools and equipment and food for the men who may have to spend a week or more on the fire line. The greatest energies of the Forest Service are directed to the prevention and suppression of fires.

For the purpose of making the timber more accessible, for facility in getting fires quickly, and for opening up the Forest to the people, the Forest Service has built, in all the National Forests, a total of 4,419 miles of roads and 23,239 miles of trail. Ten per cent of the receipts from timber sales, grazing fees, etc., is used for building roads and trails for the benefit of the public, and another 25 per cent of the receipts is paid to the States by the Federal Government for the benefit of county schools and roads. The appropriation in 1916 by Congress of \$10,000,000 to be used at the rate of \$1,000,000 a year and the appropriating in 1919 of \$10,000,000 a year for three years for the construction of National Forest roads, will make possible the building of roads on a much larger scale than has hitherto been possible.

WASHINGTON GAME LAWS, 1920

OPEN SEASONS.¹

West of Cascades.

	Dates inclusive
Deer (see exceptions), goat.....	Oct. 1–Nov. 1
Exceptions: Deer in Island and San Juan Counties, Jan. 1, 1921; does in Skagit, Snohomish, and Whatcom Counties, no open season.	
Bear.....	Sept. 1–May 1
Quail, ruffed grouse, native pheasant, Chinese pheasant (see exception), blue grouse, ptarmigan.....	Oct. 1–Oct. 15
Exception: Chinese pheasant in Clallam, Kitsap, and Skamania Counties, no open season.	
Duck, goose, brant, coot.....	Oct. 1–Jan. 15
Black-bellied and golden plovers, Wilson snipe or jacksnipe, yellowlegs.....	Oct. 1–Dec. 15
Rail.....	Oct. 1–Nov. 30

East of Cascades.

Deer (Kittitas County, Oct. 15–Dec. 1).....	Oct. 1–Nov. 15
Bear.....	Sept. 1–May 1
Goat.....	No open season
Ruffed grouse (native pheasant), blue grouse (see exceptions).....	Sept. 1–Nov. 15
Exceptions: In Asotin County (in precincts of Clarkston, South Clarkston, and West Clarkston, no open season), Garfield, and Walla Walla, Aug. 15–Oct. 1. <i>Ruffed grouse</i> in Columbia, Kittitas, and Yakima Counties, no open season. <i>Blue grouse</i> in Columbia County, no open season; in Spokane County, Oct. 1, 1919.	
Quail in Counties of Asotin (in precincts of Clarkston, South Clarkston, and West Clarkston, no open season), Garfield, and Walla Walla.....	Oct. 1–Oct. 10
Prairie chicken in Stevens County.....	Sept. 15–Oct. 1
Prairie chicken in Ferry and Okanogan Counties.....	Sept. 15–Nov. 1
Sage hen, Hungarian partridge, male Chinese and English pheasants in Kittitas County.....	Oct. 1–Oct. 10
Bob-white quail in Spokane County.....	Oct. 1–Nov. 1
Hungarian partridge in Lincoln, Spokane, and Stevens Counties.....	Oct. 1–Nov. 15
Chinese pheasants in Benton, Stevens, and Yakima Counties.....	Oct. 1–Oct. 15
Duck, goose, brant, coot.....	Sept. 16–Dec. 3
Black-bellied and golden plovers, Wilson snipe or jacksnipe, yellowlegs.....	Oct. 1–Dec. 15
Rail.....	Sept. 16–Nov. 1

¹ *Washington*: County game commission, with consent of State warden, may shorten, close, or open season upland game birds.

NO OPEN SEASON.¹

Moose, elk (1925); fawns, caribou, mountain sheep, squirrels (gray, black, fox), quail, prairie chicken, sage hens, introduced birds (except as above), turkey, and dove; swans, wood ducks, mallard ducks, auklets, auks, bitterns, little brown and sandhill cranes, fulmars, grebes, guillemots, gulls, herons, jaegers, loons, murrelets, petrels, band-tailed pigeons, puffins, shearwaters, terns, and all shore birds (except Wilson snipe or jacksnipe, black-bellied and golden plovers, and yellowlegs).

HUNTING AND FISHING LICENSES.

Nonresident: Hunting and fishing, State, \$10; fishing, county, \$2. Resident: State, \$5; county, \$1. Issued by county auditors.

No license required of honorably discharged Union soldiers of Civil War to hunt or fish, or of women and persons under 16 to fish, if residents.

BAG LIMITS AND POSSESSION.

One deer in counties east of Cascades. Two deer (1 buck in Skagit, Snohomish, and Whatcom), 1 goat in counties west of Cascades. Five in all of partridge, grouse, prairie chickens, Hungarian partridge, Chinese or English pheasant a day or in possession; 10 quail a day; upland birds, but in no event to include more than 5 upland birds other than quail, and in all of upland birds a week. In Kittitas County 2 male Chinese or English pheasants in bag; 5 upland birds; 20 ducks, geese, brant, golden plover, yellowlegs, Wilson snipe a week (week ends at midnight Saturday), but not more than 8 geese, 8 brant, 15 in all of plovers and yellowlegs a day; 30 ducks, geese, brant in possession; 50 sora and 25 in all of other rails, coots, and gallinules. Possession during close season permitted under permit, but migratory birds shall not be possessed longer than the first 10 days after close of open season.

SALE.

Sale of all protected game prohibited.

EXPORT.

Export of all protected game prohibited.

Washington: County game commission, with consent of State warden, may shorten, close, or open season on game birds.

Six Rules For Sportsmen

1. *Be a real sportsman.*—There is more honor in giving the game a square deal than in getting the limit.
2. *Make sure it's a buck.*—If you can't see his horns—she hasn't got any.
3. *Help to enforce the game law.*—Game and fish are public property and only a game hog will take more than his fair and legal share. Violations should be reported to the nearest deputy warden, Forest ranger, or game protective association.
4. *Respect the ranchman's property.*—He regards the man who leaves his gates open, cuts his fences, disturbs his live stock, or shoots near dwellings, as an outlaw. Put yourself in his place.
5. *Be careful with your camp fire and matches.*—One tree will make a million matches; one match can burn a million trees.
6. *Leave a clean camp and a clean record.*—Unburied garbage, crippled game, and broken laws are poor monuments for a sportsman to leave behind him.

Seventy-
Eight

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~ THE ~
GOVERNMENT
EXHIBIT

at the 1920
*National
Dairy Show*



UNITED STATES DEPARTMENT OF AGRICULTURE,
DEPARTMENT CIRCULAR 139,
Washington, D. C., September, 1920.

THE GOVERNMENT EXHIBIT AT THE 1920 NATIONAL DAIRY SHOW.

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MORE than half a million dollars extracted from air, sunshine, and water—a strange alchemy, indeed. Not the sort the old chemists dreamed of—turning base metals into gold—but the kind practiced by the farmers of the dairy community at Grove City, Pa. Here community development in dairying becomes a reality, through the cooperation of practical farmers, bankers, and business men, under the direction of specialists of the United States Department of Agriculture. Last year more than half a million dollars' worth of dairy products were manufactured and sold at premium prices. Most of this sum was distributed among the farmers of the community who are engaged in the enterprise, only a small part going to pay for the operation of the creamery.

Because the results are so noteworthy, so comprehensive, and so typical of what may be accomplished in other localities, the department has chosen the Grove City community as a central figure in its exhibit at the National Dairy Show. All the department's activities that concern dairymen have a place in the organization of such a community.

The exhibits in the various booths illustrate what has actually been accomplished, and it is expected that every visitor, whether dairyman, manufacturer, business man, or extension worker, will carry home ideas that he can use in his own work.

The various features of the exhibits relating to production and manufacturing were prepared by the Dairy Division, Bureau of Animal Industry, and those relating to marketing and forage crops by the Bureau of Markets and the Bureau of Plant Industry, respectively.

COMMUNITY DEVELOPMENT AT GROVE CITY.

In 1915 the Dairy Division aided in establishing a creamery at Grove City, Pa. This creamery, built with local capital, is operated under the supervision of the Dairy Division as an adjunct to its laboratories. The creamery has stimulated production by providing a market for the milk and cream produced and at the same time has helped to bring about a general development of the community.

At first only an idea, community development in dairying became a reality through the cooperation of the Dairy Division and the farmers and business men of Grove City. The movement grew slowly the first year, more rapidly the second year, and with increasing rapidity ever since.

The cow-testing association has eliminated the poor cows and replaced them with better ones, often with purebreds. The three breeders' associations have brought in many carloads of purebred dairy cattle and found a ready market for surplus dairy animals of every kind. The two bull associations have brought good bloodlines within the reach of every farmer in the district. Federal and State veterinarians have tested 387 herds for tuberculosis, and already have placed 148 herds on the tuberculosis-free accredited list. On almost every farm the buildings have been improved, and in many cases completely remodeled. The creamery has found a satisfactory market for butter, cheese, and skim-milk products. Total sales of dairy products for last year amounted to \$505,810. Farmers are active members of the Grove City Commercial Club. The Boys' and Girls' Purebred Dairy Cattle Club is training the children to carry on development work in future years. The women, likewise interested, take an active part in business and social gatherings.

In the beginning the banks helped to finance the purchase of dairy cattle. Now the farmers are less dependent on them. Bankers, farmers, merchants—all have helped and all have prospered. The schools have improved; churches have advanced; homes have become more comfortable; and farm life has become more pleasant and attractive.

In the booths of the exhibit will be found detailed information on the lines of work which have contributed to the development of the Grove City community. Study these exhibits carefully. What the people of the Grove City community have done others can do. Their work is a lesson to wide-awake progressive and public-spirited dairymen everywhere.

DEVELOPMENT OF A DAIRY COMMUNITY.

The central feature of the whole Government exhibit is an attractive model representing the Grove City community. On one side is a rural scene and on the other a village. In the village there is a model

of the Grove City creamery, by which dairy products of the community are prepared for market. A railroad train carries the products away from the creamery. The whole exhibit shows how a community may handle its dairy products, utilizing the surplus, and putting out high-grade commodities that command good market prices.

PRODUCTS OF THE GROVE CITY CREAMERY.

So far as possible all the solids in the milk delivered at the creamery are used for the manufacture of human-food products which are usually more profitable than animal-feed products and nonedible products. The creamery purchases the farmer's skim milk as well as his cream, and there is an increasing tendency among farmers to sell the entire milk instead of keeping the skim milk on the farm.

Before the community-development work was begun practically no dairy products were shipped from Grove City. The following figures show the extent of dairy production in the community during the last year:

Products of the Grove City Creamery for the year ended June 30, 1920.

Butter.	Con- densed skim milk.	Cheese.					Casein.
		Swiss.	Camem- bert.	Roque- fort.	Cheddar.	Cottage.	
<i>Pounds.</i> 503, 909	<i>Pounds.</i> 828, 065	<i>Pounds.</i> 112, 927	<i>Pounds.</i> 7, 737	<i>Pounds.</i> 12, 378	<i>Pounds.</i> 21, 393	<i>Pounds.</i> 230, 968	<i>Pounds.</i> 30, 773

The exhibit contains samples of the butter, condensed milk, and casein, and the Swiss, Camembert, and Roquefort cheese made at the Grove City creamery. Information as to methods and cost of manufacture, and the prices received for these products, is available.

These products and the related information are presented for the benefit of those interested in dairy manufacturing. Study them carefully; some of them may be manufactured profitably in your locality.

THE SWISS-CHEESE FACTORY.

Can Swiss cheese equal to the imported product in quality and uniformity be made in the United States?

A few years ago the answer might have been "No." To-day it is more likely to be "Yes."

By the method of using prepared cultures developed by the Dairy Division, and demonstrated in this exhibit, quality in Swiss cheese has become almost a certainty. Taking advantage of this fact, the Grove City creamery began the manufacture of Swiss cheese in 1919.

One hundred pounds of milk containing 3.25 per cent butterfat will make about $8\frac{1}{2}$ pounds of cheese, and besides from one-half to three-fourths pound of fat suitable for buttermaking can be recovered from the whey. If the cheese is of first quality it will bring 45 cents a pound. True, a considerable portion of the Swiss cheese now made in this country is of inferior quality, bringing only 35, 30, or even 20 cents a pound; but by careful manufacturing and the use of proper cultures, it is believed that these low grades can be largely eliminated.

The exhibit not only shows the process of making and curing Swiss cheese, but also illustrates new methods introduced by the Dairy Division, which, if properly applied to high-grade raw material, should make the domestic Swiss equal to the imported. The

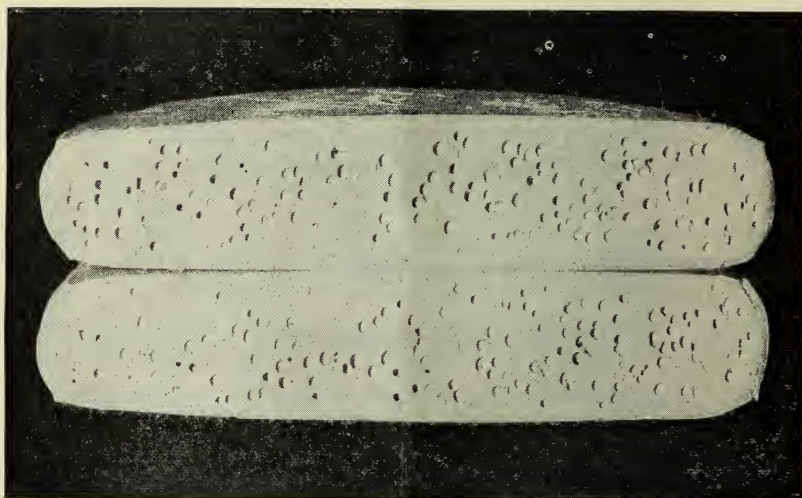


FIG. 1.—Type of the high-quality domestic Swiss cheese made at Grove City, Pa.

peculiar flavor and the holes or eyes of Swiss cheese are the result of the growth of certain bacteria which the maker tries to encourage. In the laboratory adjoining the miniature factory the bacteriologists grow and prepare for distribution to factories two types of bacteriological cultures. One develops acidity in the cheese so rapidly that the undesirable bacteria are suppressed; the other, which grows more slowly, gives the cheese its characteristic eyes and flavor.

The exhibit includes a warm and a cold curing room, the former to encourage the formation of eyes, the latter to hold the cheese for the slow development of the delicate flavor which is found in the finest grades.

COW-TESTING-ASSOCIATION EXHIBIT.

The Grove City district has one of the 468 cow-testing associations that are now at work in the United States. The results at Grove City and elsewhere are shown and explained in the cow-testing-association booth. An illuminated exhibit of maps and charts shows the location of all the associations and gives their growth in numbers each year since the work began, in Newaygo County, Mich., in 1906.

Two years' records from the Grove City association are now available, and the figures on one chart show clearly what a cow-testing association does for a dairy community. For the second year, the figures show an average gain, per cow, of 656 pounds of milk, 36 pounds of butterfat, and \$30.58 income over cost of feed.

The cow-testing-association booth shows a mechanical device that vividly compares the records of low and high producing dairy cows. By means of butter cartons the records of cow-testing-association cows appear in contrast with average cows and also with world-record cows. It has been estimated that the average dairy cow produces 160 pounds of butterfat in a year. Association cows average about 246 pounds. The world's record is 1,205.09 pounds, or about $7\frac{1}{2}$ times as much as the average for all the dairy cows in the United States.

The cow-testing-association booth is well supplied with bulletins and circulars that tell how to conduct the work and what results may be expected. On the wall are a dozen charts that tell the story of the progress made in the Grove City association and the Newaygo County (Mich.) association, and that show the results of the tabulation of more than 40,000 individual cow records. One chart defines a cow-testing association as "an organization of about 26 farmers who milk cows and who cooperatively employ a man to test their cows for economical production." The charts show clearly that it pays a dairyman to know the feed and production records of his cows and to feed each cow according to known production.

COW-TESTING-ASSOCIATION DEMONSTRATION HERD.

Can you tell by the appearance of a cow how many pounds of milk she will produce in a year? If so, can you tell what her milk will test? Can you tell by observation how much roughage and grain she has consumed to produce that milk and butterfat—in other words, how much it has cost to feed her for a year? If not, you had better stop and study the demonstration herd.

This herd consists of 12 cows whose feed and production records have been carefully kept for a year or more in a cow-testing association. From the conformation and general appearance of each cow, you are invited to estimate her production of milk and butterfat and

her earnings over cost of feed. Then compare your estimates with the cow-testing-association records.

In untested herds sentiment often plays a large part in selection. Too frequently the favorite cow is not the most profitable producer, and it is through the cow-testing association that the best cows are selected for production and breeding purposes. The association also furnishes an accurate yearly record of the milk and butterfat production and of the feed consumed by each individual in the herd.

The exhibit shows how the cow-testing-association records enable the farmer to determine the value of different methods of dairy management, such as the feeding of soiling crops, silage, and alfalfa;



FIG. 2.—In this animated exhibit a cow of high production jumps over the moon, while another—a less profitable cow—fails to do so.

when to supplement the pastures with other feed, and the relative merits of different dates of freshening. By comparing the records of the dams and daughters, the cow-testing association also furnishes definite information as to the true value of dairy sires. In short, the records furnish the information necessary for the building up of high-producing profitable dairy herds.

The cows in the demonstration herd are from a Wisconsin cow-testing association. The owners of the cows will be there, and they as well as the man in charge of the exhibit will answer questions regarding the records and care of each cow. These men are also ready to give information on the organization and management of cow-testing associations, and the progressive dairyman will find there a practical lesson.

THE BULL-ASSOCIATION EXHIBIT.

That bull associations are important in the development of a community is indicated by results at Grove City, where there are two associations—one a Holstein and the other a Jersey.

The reduced cost of providing good purebred bulls is an advantage of the association that first appeals to the dairyman; but the outstanding advantage is that bulls owned by the association are kept until their daughters are tested. Bulls of great value, owned by individuals, have frequently been slaughtered before their value was known. Through the bull associations, however, bulls worth thousands of dollars have been saved for use as long as they live.

In addition to the advantages mentioned, bull associations establish permanently in a community a certain breed or breeds. This is an important feature from a marketing point of view, as breeders can supply the demand for carload lots of cattle of uniform breeding.

More than 120 communities in the United States now have active bull associations, and in other communities the work is strongly indorsed.

The bull-association booth contains some of the results obtained in 78 associations in the United States in 1919. A map of a bull association shows graphically the organization, the average number of blocks; average number of members, location of blocks and members, and number of cows in a typical association.

The photographs of typical association bulls and their progeny, tabulation of growth of associations, and a model of a bull-association block, shown in this exhibit, throw further light on the method of operation and the results obtained in the various associations.

The exhibit is the medium through which the 2,978 farmers from 27 States tell you what they have accomplished. Where graphic illustration fails to give the information desired, the specialist in charge of the work will personally convey the message.

CONTROL OF INFECTIOUS DISEASES.

Previous to April, 1918, the Grove City community had practically no tuberculin-tested cattle, with the exception of a few which had been tested for interstate shipment. During the early part of 1918 systematic disease-control measures were begun and from April, 1918, to May, 1920, 387 herds, consisting of 4,988 animals, were tested under the accredited-herd plan. Of these, 148 herds are already accredited and others are in process of becoming so.

Four per cent of all cattle tested in the vicinity have been found to be tuberculous, which is about the average for all cattle tested in the United States. Owing to cooperative control measures, other infectious diseases are causing only small losses in the Grove City community.

Dairymen and extension workers interested in disease control will find in the exhibit specimens of actual tissues, showing lesions caused by various diseases, especially tuberculosis and abortion. A study of the models of carcasses of two cows—one in which the organs are normal and one in which the organs and glands are affected with tuberculosis—will give a concrete idea of the nature of the disease.

Charts showing progress of disease-control work with Texas fever, scabies, foot-and-mouth disease, tuberculosis, and other disorders, will be found in the exhibit, as well as photographs and charts of diseased herds and a record of the work in local areas.

"BETTER SIRES—BETTER STOCK."

Among the exhibits showing Government activities in behalf of better livestock and community development is a booth explaining the Nation-wide "Better Sires—Better Stock" movement. Features of this exhibit are three wheels of chance which visitors will be invited to spin. These wheels show with mathematical certainty why the user of scrub bulls obtains calves of inferior quality, while the wiser breeder who uses purebred bulls reaps the rich reward of proper selection. But unlike the games of chance which leave the visitor poorer though wiser, the Government wheels enable him to depart richer in breeding information.

A series of pictures, under the title "Bankrupts of Nature," is another part of the "Better Sires—Better Stock" exhibit. The pictures, with explanations, show prehistoric animals which were unable to survive the competition of other animals or to satisfy human needs. As a result these animals have become extinct. Scrub bulls are included in the group as the next class of livestock to become a bankrupt of nature. Still another group of pictures illustrates graphically how and why a well-bred productive cow is foster mother of more babies than an inferior scrub cow.

Although dairy cattle will be given prominence at the "Better Sires—Better Stock" booth, the principles of breeding illustrated apply equally well to other kinds of livestock. Besides being of value to breeders and persons interested in developing dairy herds, the better-sires exhibit includes suggestions to county agents and extension workers seeking effective means of improving livestock in their communities.

COST OF MILK PRODUCTION.

Consumers and others often think that the farmer is getting too much for his milk. The only way to settle the question is to have definite, concise figures on the cost of producing milk in each community. The Dairy Division has organized community groups in 7 States for this purpose. Each group consists of about 20 repre-

sentative dairy farms, with a supervisor in charge. Cost items are collected in terms of quantity rather than price, wherever possible. Results may then be interpreted at any time, using prevailing prices.

Data from four of the States studied—Indiana, Vermont, North Carolina, and Washington—will be available at the exhibit. These data include the requirements for producing 100 pounds of milk, requirements for keeping a cow one year, cost of keeping a bull, and other useful information.

A market milk specialist will be in charge of the exhibit to answer questions.

MINERAL REQUIREMENTS FOR MILK PRODUCTION.

In order to produce milk liberally cows must have a variety of chemical compounds in their feed, in sufficient quantity. If any one of these compounds is not supplied in sufficient quantity, the amount of milk given will be limited sooner or later by the amount of that compound in the feed, no matter how liberally all the other elements are supplied. The milk yields may not be immediately reduced by the lack of some necessary element in the feed, because for a time the cow may be able to supply the element in question from the substance of her own body.

An exhibit on this important subject shows that even when cows receive as much protein and total nutrient as is required by the feeding standards their milk yield may gradually decrease until, after several years, it is less than half of what it might be.

But the yields of cows so fed for some years may be increased by feeding sodium phosphate during their dry periods. These results indicate that the elements most likely to be insufficient in the ordinary dairy rations are the bone-building elements, calcium and phosphorus.

Persons interested in increasing the milk production of their cows will find it to their advantage to visit this booth.

THE BANK IN THE DAIRY COMMUNITY.

The activity of a national bank of Grove City in the development of dairy enterprise in its community has been to make working capital immediately and easily available to the farmer.

Though this is the function of any bank alert to its opportunities, the bank referred to has conducted a systematic campaign to cultivate among its patrons, especially dairy farmers, the habit of getting the best.

The bank was not content with the mere furnishing of funds, at current rates, for the purchase of improved stock. Its officers have personally interested themselves in the purchase and distribution of purebred animals and have cooperated with the dairy husbandman connected with the creamery in many other lines of dairy-develop-

ment work, thus making the service of the bank, instead of coldly commercial and financial, a vitally-helpful ministry.

In the bank booth will be found a representative of the bank, who will be glad to discuss how other banks may aid in developing dairy communities. The following activities have featured the work in Grove City. They are applicable to other communities.

Purebred importations.—Since 1916 the bank has assisted in the purchase and distribution, among farmer patrons of the creamery, of 12 carloads of purebred tuberculin-tested dairy cattle. In the immediate vicinity of Grove City there are now more than 250 farmers owning one or more purebred dairy animals.

Boys' and girls' clubs.—Several carloads of purebred heifers were distributed to boys and girls of the community, the bank accepting in payment renewable notes.

Breeders' associations.—Three breeders' associations were organized in the community with the cooperation of the officers of the bank. The bank has financed the somewhat extensive purchase of the best available bulls.

Accredited-Herd Association.—One of the most effective organizations which the bank has cooperated in organizing is the accredited-herd and sales association. The herds of all members are tested for tuberculosis and accredited accordingly, and the member herds make up more than one-half of all the accredited herds in the State.

Dairy stock show.—The bank for the last five years has provided the prizes for the annual Grove City Dairy Stock Show, and its officers have been active in making the show the dairy event in that section of Pennsylvania.

Thrift clubs.—The bank has organized thrift clubs among the school children in a number of country districts. The members of these clubs receive personal instruction from officers of the bank in the processes of banking.

The Grove City National.—For more than three years the bank has been publishing a monthly paper, *The Grove City National*, devoted entirely to subjects of agricultural and particularly of dairy interest. In addition there are selected editorials, the monthly creamery report, the detailed report of the Grove City Cow-Testing Association, the sales list of the Accredited-Herd Association, and a classified list of farm products, animals, and equipment for local sale or exchange. No charge is made for these notices, and the paper is sent free to every farmer in the community and to others who wish to receive it.

THE MILK-UTILIZATION EXHIBIT.

In many communities there is need of increased consumption of milk as a means of combating undernourishment and improving health, especially among children. Community milk campaigns have been especially effective for this purpose, and many of the more progressive cities and communities, including Boston, Detroit, Pittsburgh, Seattle, Spokane, and others, have already held successful



FIG. 3.—A result of a milk campaign; drinking milk for health and mental alertness at a public school.

campaigns. An exhibit on this subject shows just how the urban and rural campaigns are organized and what they can accomplish toward increasing the use of milk in the home, particularly by children. This is stated in terms of improved health, conduct, and scholarship.

Milk-feeding demonstrations with children will be featured each day. These will show how to conduct such demonstrations in the public schools as well as in the home. The increase in weight of undernourished children, when a pint or a quart of milk is given

each one in addition to the regular diet, is illustrated by charts prepared from actual tests.

What have the milk campaigns done toward utilizing supplies of whole milk as such? The answer, given in terms of quarts of milk and their value, is a surprise for those not familiar with the work.

Another interesting part of the exhibit shows milk posters prepared by school children, and also some of the prize-winning essays entered in the contests.

A second exhibit is interesting not only because it drives home the point that milk makes for improved health, but because the idea came from a poster prepared by a fifth-grade schoolboy in one of the poster contests. A "Fort of Ill Health" is being demolished by milk-bottle shells, milk-bottle bombs, and milk-bottle soldiers.

How community health has improved because of an increased use of milk is illustrated with charts. The value of milk as a food is emphasized by showing its unexcelled protein efficiency, its lime efficiency, and the value of butterfat for growth and health.

Is there a need for a milk campaign in your community? Visit this exhibit and talk with the milk-utilization specialist in charge. Consumers, dairymen, and extension workers especially, will obtain valuable information and suggestions.

DAIRY-STATISTICS EXHIBIT.

Dairy statistics not only show what has happened in the past, but by indicating the trend of the industry they also throw some light on the future. The successes or failures of dairy enterprises throughout the world are written in the dairy statistics of each country, and the facts represented here become interesting when a new enterprise is to be begun or a campaign launched, whether in a community, in a State, or in an entire country.

In the exhibit of dairy statistics will be found simple charts indicating the progress, trend, and development of dairying in the United States and other countries. The war's effect on dairying throughout the world, as well as the extent to which the countries have been able to "come back," is shown.

Look over the following questions. If you can not answer them you will do well to stop at the statistics booth and obtain the latest figures compiled by the Department of Agriculture.

How many cows are there in the United States?

What is the average annual production of milk per cow?

How do our cows compare in production with those of other countries?

How much butter, cheese, condensed milk, etc., are we producing?

How much butter, cheese, etc., are we exporting? Importing?

How much of each of these products is consumed per capita in the United States?

What is the per capita consumption of butter and cheese in other countries?

These last two questions are answered in a striking way through the use of models showing the exact quantities of butter and cheese consumed each year per capita in the different countries, as well as the per capita consumption of all dairy products in the United States.

FORAGE-CROP EXHIBIT.

Successful dairying in any community is so dependent upon an all-year supply of highly nutritious succulent feed, green or silage, and properly maintained meadows and pastures, that no efforts are spared by the Department of Agriculture in its search for and study of such crops as will best serve the dairymen in all sections of the United States.

The Office of Forage Crop Investigations of the Bureau of Plant Industry presents in a series of transparent colored photographs an instructive and attractive exhibit illustrating the value and utilization of important forage crops in various sections of the United States.

It is interesting to note among the many forage crops introduced by the Department of Agriculture such excellent examples as Peruvian and Arabian alfalfas, numerous superior soy-bean varieties, purple vetch, Chinese and Yokohama velvet bean; Early buff, Groit, and Brabham cowpeas; Sudan, Rhodes, and other valuable grasses; feterita, Honey, Red Amber, Pink Kafir, and other sorghums; Siberian and Kursk millets; and a host of other valuable forage plants.

MARKETING DAIRY PRODUCTS.

Accounting methods in dairy marketing organizations.—The efficient manager of a dairy establishment should know at all times not only the true condition of the business as a whole, but also which departments are conducted at a profit and which at a loss.

The true condition of the business is reflected in a proper system of accounting. It is the aim of the Bureau of Markets to make its work specifically helpful to organizations marketing farm products.

Extensive studies of accounting requirements for creameries and milk plants and the cost of marketing milk are now being made, with a view to effecting more economical methods. Bulletins describing systems of accounting are available for free distribution.

The accountant in charge of the booth will furnish interested persons with any additional information regarding the assistance that the Bureau of Markets renders to dairy manufacturing and marketing concerns.

Market reports on dairy products.—Telegraphic connections with the Chicago office of the bureau (Room 516, City Hall Square Building, 139 North Clark Street), which in turn is connected by leased telegraph wires with the other eastern offices, enable reports from all the markets to be available in the bureau's booth at the Dairy Show.

The attendant at the booth will be glad to furnish interested persons with any additional information desired regarding the market reports on dairy products or other lines of dairy marketing work conducted by the Bureau of Markets.

Market inspection of dairy products.—A market inspection service on butter is provided by the Bureau of Markets at Boston, Chicago, New York, and Philadelphia. On application, the inspectors at those markets will certify as to the quality and condition of butter received in interstate commerce. This service has been very widely used by both shippers and receivers. The attendant in charge will furnish additional information regarding this service to those interested. He will also demonstrate the methods of butter inspection, using samples of butter on exhibit for that purpose.

Dairy marketing statistics.—The question is often asked by producers, manufacturers, and distributors, "Where can we obtain dependable market information on the dairy industry?" The Bureau of Markets through its market-news service on dairy products compiles the essential data and information, and is now in position to place this information in the hands of interested persons. Reports on the amounts of different kinds of dairy products manufactured are received from more than 10,000 firms representing about 95 per cent of the total production. From this and other sources data are compiled, and such information as total production, stocks in storage, receipts at terminal wholesale markets, exports, imports, prices, etc., are available and will be furnished to any one making request for them.

Sample reports, charts, graphs, and other information comprise a part of the exhibit. Leave your name and address with the representative in charge for any information desired.

Cooperative purchasing and marketing.—During recent years there has been a rapid development and a largely increased interest in cooperative organizations among farmers. The exhibit relating to cooperative marketing will give visitors timely information regarding the organization of cooperative marketing associations.

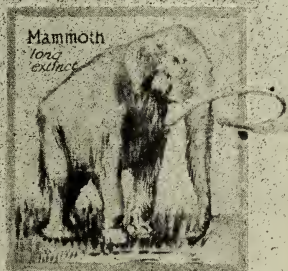
The exhibit consists of charts and maps which place emphasis on points of importance in organizing cooperative marketing enterprises. These charts show some of the accomplishments of cooperative marketing, essential features of good organization, and requirements for success in cooperative marketing enterprises.

BANKRUPTS OF NATURE

They couldn't stand competition
or meet human requirements.



Should be extinct in the
United States about 1925.
Variety - Bologna (taurus)
Replaced by good purebreds.



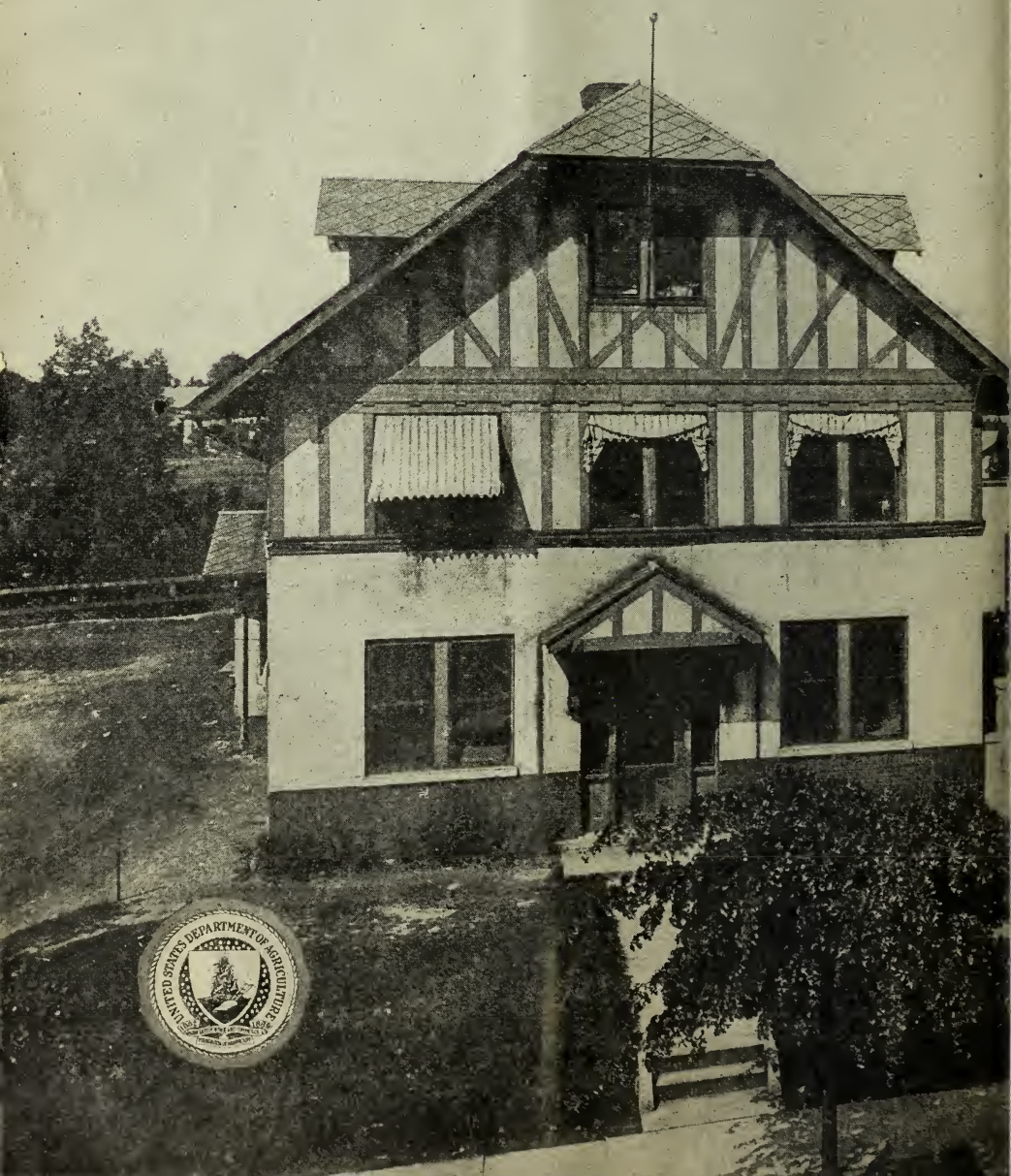
Useless Animals in Time Become Extinct
Have you any of these on your farm?

"Better Sires - Better Stock"



FIG. 4.—Facsimile of one of the charts in the "Better Sires—Better Stock" booth.

How Dairying Developed a Community



STATISTICS OF COOPERATIVE EXTENSION WORK 1920-21



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 140

Contribution from the States Relations Service
A. C. TRUE, Director

Washington, D. C.

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STATISTICS OF COOPERATIVE EXTENSION WORK, 1920-21.

This circular summarizes statistics relating to sources, amounts, and project allotment of funds used and number and distribution of persons employed by the State agricultural colleges receiving the benefits of the act of Congress of May 8, 1914 (Smith-Lever Act), providing for the extension work in agriculture and home economics in cooperation with the United States Department of Agriculture. These statistics have been compiled in part from the budget statements in which the State agricultural colleges have outlined their plan of work and in part from records on file in the States Relations Service.

TABLE I.—*Maximum amounts of Federal funds which each State ¹ is eligible to receive under the cooperative extension act.²*

State.	Fiscal year 1915-16.	Fiscal year 1916-17.	Fiscal year 1917-18.	Fiscal year 1918-19.	Fiscal year 1919-20.	Fiscal year 1920-21.
Alabama.....	\$31,491.82	\$49,401.67	\$67,311.52	\$85,221.37	\$103,131.22	\$121,041.07
Arizona.....	11,715.47	13,145.03	14,574.59	16,004.15	17,433.71	18,863.27
Arkansas.....	26,678.41	40,577.08	54,475.75	68,374.42	82,273.09	96,171.76
California.....	21,037.45	30,255.33	39,433.21	48,631.09	57,828.97	67,026.85
Colorado.....	14,792.62	18,786.47	22,780.32	26,774.17	30,768.02	34,761.87
Connecticut.....	11,397.20	12,561.53	13,725.86	14,890.19	16,054.52	17,218.85
Delaware.....	11,279.51	12,345.76	13,412.01	14,478.26	15,544.51	16,610.76
Florida.....	16,486.94	21,892.73	27,298.52	32,704.31	38,110.10	43,515.89
Georgia.....	35,173.47	56,151.36	77,129.25	98,107.14	119,085.03	140,062.92
Idaho.....	13,108.84	15,699.54	18,290.24	20,880.94	23,471.64	26,062.34
Illinois.....	36,282.20	58,184.03	80,085.86	101,987.69	123,889.52	145,791.35
Indiana.....	28,931.02	44,706.87	60,482.72	76,258.57	92,034.42	107,810.27
Iowa.....	28,781.18	44,432.16	60,083.14	75,734.12	91,385.10	107,036.08
Kansas.....	24,555.45	36,685.00	48,814.55	60,944.10	73,073.65	85,203.20
Kentucky.....	31,088.17	48,661.65	66,235.13	83,808.61	101,382.09	118,955.57
Louisiana.....	24,102.11	35,853.87	47,605.63	59,357.39	71,109.15	82,860.91
Maine.....	14,388.28	18,045.18	21,702.08	25,358.98	29,015.88	32,672.78
Maryland.....	17,746.73	24,202.34	30,657.95	37,113.56	43,569.17	50,024.78
Massachusetts.....	12,930.75	15,373.04	17,815.33	20,257.62	22,699.91	25,142.20
Michigan.....	28,032.37	43,059.35	58,086.33	73,113.31	88,140.29	103,167.27
Minnesota.....	24,898.99	37,314.81	49,730.63	62,146.45	74,562.27	86,978.09
Mississippi.....	29,329.35	45,437.14	61,544.93	77,652.72	93,760.51	109,868.30
Missouri.....	33,034.17	52,229.32	71,424.47	90,619.62	109,814.77	129,009.92
Montana.....	12,950.01	15,408.35	17,866.69	20,325.03	22,783.37	25,241.71
Nebraska.....	20,715.89	29,645.80	38,575.71	47,505.62	56,435.53	65,365.44
Nevada.....	10,832.94	11,527.06	12,221.18	12,915.30	13,609.42	14,303.54
New Hampshire.....	12,133.46	13,911.34	15,689.22	17,467.10	19,244.98	21,022.86
New Jersey.....	17,659.22	24,041.91	30,424.60	36,807.29	43,189.98	49,572.67
New Mexico.....	13,413.20	16,257.54	19,101.88	21,946.22	24,790.56	27,634.90
New York.....	33,412.72	52,078.32	72,513.92	92,049.52	111,555.12	131,120.72
North Carolina.....	32,952.65	52,079.86	71,207.07	90,334.28	109,461.49	128,588.70
North Dakota.....	16,247.19	21,453.18	26,659.17	31,865.16	37,071.15	42,277.14
Ohio.....	35,556.54	56,853.66	78,150.78	99,447.90	120,745.02	142,042.14
Oklahoma.....	26,255.69	39,802.10	53,348.51	66,894.92	80,441.33	93,987.74
Oregon.....	14,446.36	18,151.66	21,856.96	25,562.26	29,267.56	32,972.86
Pennsylvania.....	46,893.54	77,638.33	108,383.33	139,128.12	169,872.91	200,617.70
Rhode Island.....	10,218.31	10,400.24	10,582.17	10,764.10	10,946.03	11,127.96
South Carolina.....	25,691.15	38,767.11	51,843.07	64,919.03	77,994.99	91,070.95
South Dakota.....	16,166.89	21,305.96	26,445.03	31,584.10	36,723.17	41,862.24
Tennessee.....	31,201.01	48,868.52	66,536.03	84,203.54	101,871.05	119,538.56
Texas.....	45,969.67	75,944.39	105,919.11	135,893.83	165,868.55	195,843.27
Utah.....	12,436.74	14,467.35	16,497.96	18,528.57	20,559.18	22,589.79
Vermont.....	12,273.77	14,168.57	16,063.37	17,958.17	19,852.97	21,747.77
Virginia.....	29,271.96	45,331.93	61,391.90	77,451.87	93,511.84	109,571.81
Washington.....	16,522.46	21,957.84	27,393.22	32,828.60	38,263.98	43,699.36
West Virginia.....	22,071.73	32,311.50	42,191.27	52,251.04	62,310.81	72,370.58
Wisconsin.....	26,164.99	39,635.81	53,106.63	66,577.45	80,048.27	93,519.09
Wyoming.....	11,249.20	12,290.20	13,331.20	14,372.20	15,413.20	16,454.20
Total.....	1,080,000.00	1,580,000.00	2,080,000.00	2,580,000.00	3,080,000.00	3,580,000.00

¹ In 1914-15, the amount of \$10,000 was allotted to each State.

² Each State must duplicate all Federal money above \$10,000 per year.

4 Department Circular 140, U. S. Dept. of Agriculture.

TABLE II.—Sources of offset to Federal Smith-Lever funds, 1919-20 and 1920-21, and Federal supplementary extension funds, 1919-20 and 1920-21.

State.	Total.	State.	County.	College.	Local.
Alabama:					
1919-20.....	\$93,131.22	\$92,500.00	\$631.32		
Supplementary.....	53,729.55	20,000.00	33,729.55		
1920-21.....	111,041.07	92,139.83	18,901.24		
Supplementary.....	53,729.55	35,729.55	18,000.00		
Arizona:					
1919-20.....	7,433.71	7,433.71			
Supplementary.....	4,288.68	4,288.68			
1920-21.....	8,863.27	8,863.27			
Supplementary.....	4,288.68	4,288.68			
Arkansas:					
1919-20.....	72,273.09	72,273.09			
Supplementary.....	41,696.01		41,696.01		
1920-21.....	86,171.76	86,171.76			
Supplementary.....	41,696.01		41,696.01		
California:					
1919-20.....	47,828.97	47,828.97			
Supplementary.....	27,593.64	27,593.64			
1920-21.....	57,026.85	57,026.85			
Supplementary.....	27,593.64	27,593.64			
Colorado:					
1919-20.....	20,768.02	20,768.02			
Supplementary.....	11,981.55	4,046.00	7,935.55		
1920-21.....	24,761.87	24,761.87			
Supplementary.....	11,981.55	4,781.55		\$7,200	
Connecticut:					
1919-20.....	6,054.52	6,054.52			
Supplementary.....	3,492.99	3,492.99			
1920-21.....	7,218.85	7,218.85			
Supplementary.....	3,492.99	3,492.99			
Delaware:					
1919-20.....	5,544.51	5,544.51			
Supplementary.....	3,198.75				\$3,198.75
1920-21.....	6,610.76	6,610.76			
Supplementary.....	3,198.75				3,198.75
Florida:					
1919-20.....	28,110.10	28,110.10			
Supplementary.....	16,217.37	16,217.37			
1920-21.....	33,515.89	33,515.89			
Supplementary.....	16,217.37		16,217.37		
Georgia:					
1919-20.....	109,085.03	109,085.03			
Supplementary.....	62,933.67		62,933.67		
1920-21.....	130,062.92	130,062.92			
Supplementary.....	62,933.67		62,933.67		
Idaho:					
1919-20.....	13,471.64	13,471.64			
Supplementary.....	7,772.10	7,772.10			
1920-21.....	16,062.34	16,062.34			
Supplementary.....	7,772.10	7,772.10			
Illinois:					
1919-20.....	113,889.52	83,400.00			30,489.52
Supplementary.....	65,705.49				65,705.49
1920-21.....	135,791.35	81,600.00			54,191.35
Supplementary.....	65,705.49				65,705.49
Indiana:					
1919-20.....	82,034.42	82,034.42			
Supplementary.....	47,327.55	47,327.55			
1920-21.....	97,810.27	80,000.00	17,810.27		
Supplementary.....	47,327.55		47,327.55		
Iowa:					
1919-20.....	81,385.10	81,385.10			
Supplementary.....	46,952.94	4,650.00	42,302.94		
1920-21.....	97,036.08	18,036.08	79,000.00		
Supplementary.....	46,952.94		46,952.94		
Kansas:					
1919-20.....	63,073.65	63,073.65			
Supplementary.....	36,388.65		36,388.65		
1920-21.....	75,203.20	75,203.20			
Supplementary.....	36,388.65		36,388.65		
Kentucky:					
1919-20.....	91,382.09	91,382.09			
Supplementary.....	52,720.44	2,720.44	50,000.00		
1920-21.....	108,955.57	108,955.57			
Supplementary.....	52,720.44		52,720.44		
Louisiana:					
1919-20.....	61,109.15	48,500.00	12,609.15		
Supplementary.....	35,255.28		35,255.28		
1920-21.....	72,860.91	40,460.91	30,000.00		2,400.00
Supplementary.....	35,255.28		35,255.28		
Maine:					
1919-20.....	19,015.88	19,015.88			
Supplementary.....	10,970.70	10,970.70			
1920-21.....	22,672.78	22,672.78			
Supplementary.....	10,970.70		10,970.70		

TABLE II.—Sources of offset to Federal Smith-Lever funds, 1919-20 and 1920-21, and Federal supplementary extension funds, 1919-20 and 1920-21—Continued.

State.	Total.	State.	County.	College.	Local.
Maryland:					
1919-20.....	\$33,569.17	\$33,569.17			
Supplementary.....	19,366.83	19,366.83			
1920-21.....	40,024.78	40,024.78			
Supplementary.....	19,366.83	19,366.83			
Massachusetts:					
1919-20.....	12,699.91	12,699.91			
Supplementary.....	7,326.87	7,326.87			
1920-21.....	15,142.20	15,142.20			
Supplementary.....	7,326.87		\$7,326.87		
Michigan:					
1919-20.....	78,140.29	78,140.29			
Supplementary.....	45,080.94		45,080.94		
1920-21.....	93,167.27	93,167.27			
Supplementary.....	45,080.94		45,080.94		
Minnesota:					
1919-20.....	64,562.27	64,562.27			
Supplementary.....	37,217.46				
1920-21.....	76,978.09	76,978.09	37,247.46		
Supplementary.....	37,247.46		37,247.46		
Mississippi:					
1919-20.....	83,760.51	47,000.00	36,760.51		
Supplementary.....	48,323.37		48,323.37		
1920-21.....	99,868.30	96,200.00	3,668.30		
Supplementary.....	48,323.37		48,323.37		
Missouri:					
1919-20.....	99,814.77	70,000.00	29,814.77		
Supplementary.....	57,585.45		30,000.00		\$27,585.45
1920-21.....	119,009.92	70,000.00			49,009.92
Supplementary.....	57,585.45				57,585.45
Montana:					
1919-20.....	12,783.37	12,783.37			
Supplementary.....	7,375.02	7,375.02			
1920-21.....	15,241.71	15,241.71			
Supplementary.....	7,375.02	7,375.02			
Nebraska:					
1919-20.....	46,435.53			\$46,435.53	
Supplementary.....	26,789.73		26,789.73		
1920-21.....	55,365.44			55,365.44	
Supplementary.....	26,789.73		26,789.73		
Nevada:					
1919-20.....	3,609.42	3,609.42			
Supplementary.....	2,082.36	2,082.36			
1920-21.....	4,303.54			4,303.54	
Supplementary.....	2,082.36			2,082.36	
New Hampshire:					
1919-20.....	9,244.98	9,244.98			
Supplementary.....	5,333.64		5,333.64		
1920-21.....	11,022.86	11,022.86			
Supplementary.....	5,333.64		5,333.64		
New Jersey:					
1919-20.....	33,189.98	33,189.98			
Supplementary.....	19,148.07	6,810.02	12,338.05		
1920-21.....	39,572.67	39,572.67			
Supplementary.....	19,148.07	19,148.07			
New Mexico:					
1919-20.....	14,790.56	14,790.56			
Supplementary.....	8,533.02	8,533.02			
1920-21.....	17,634.90	17,634.90			
Supplementary.....	8,533.02		8,533.02		
New York:					
1919-20.....	101,585.12	93,135.12		8,450.00	
Supplementary.....	58,606.80	58,750.00		1,856.80	
1920-21.....	121,120.72	6,000.00	51,000.00	64,120.72	
Supplementary.....	58,606.80	51,000.00		7,606.80	
North Carolina:					
1919-20.....	99,461.49	99,461.49			
Supplementary.....	57,381.63	30,000.00	27,381.63		
1920-21.....	118,588.70	118,588.70			
Supplementary.....	57,381.63	30,000.00	27,381.63		
North Dakota:					
1919-20.....	27,071.15	27,071.15			
Supplementary.....	15,617.97		15,617.97		
1920-21.....	32,277.14	32,277.14			
Supplementary.....	15,617.97	9,999.86	5,618.11		
Ohio:					
1919-20.....	110,745.02	110,745.02			
Supplementary.....	63,891.36		63,891.36		
1920-21.....	132,042.14	132,042.14			
Supplementary.....	63,891.36		63,891.36		
Oklahoma:					
1919-20.....	70,441.33	70,441.33			
Supplementary.....	40,639.23		40,639.23		
1920-21.....	83,987.74	83,987.74			
Supplementary.....	40,639.23		40,639.23		

6 Department Circular 140, U. S. Dept. of Agriculture.

TABLE II.—Sources of offset to Federal Smith-Lever funds, 1919-20 and 1920-21, and Federal supplementary extension funds, 1919-20 and 1920-21—Continued.

State.	Total.	State.	County.	College.	Local.
Oregon:					
1919-20.....	\$19,267.56	\$19,267.56			
Supplementary.....	11,115.90		\$11,115.90		
1920-21.....	22,972.86	22,972.86			
Supplementary.....	11,115.90		11,115.90		
Pennsylvania:					
1919-20.....	159,872.91	102,372.91	57,500.00		
Supplementary.....	25,000.00	25,000.00			
1920-21.....	190,617.70	190,617.70			
Supplementary.....	92,234.37	11,382.30	80,852.07		
Rhode Island:					
1919-20.....	946.03	946.03			
Supplementary.....	545.79			\$545.79	
1920-21.....	1,127.96			1,127.96	
Supplementary.....	545.79			545.79	
South Carolina:					
1919-20.....	67,994.99	67,994.99			
Supplementary.....	39,227.88		39,227.88		
1920-21.....	81,070.00	81,070.00			
Supplementary.....	39,227.88		39,227.88		
South Dakota:					
1919-20.....	26,723.17	26,723.17			
Supplementary.....	15,417.21	15,417.21			
1920-21.....	31,862.24	31,862.24			
Supplementary.....	15,417.21	15,417.21			
Tennessee:					
1919-20.....	91,871.05	48,000.00	43,871.05		
Supplementary.....	38,865.00	1,000.00	37,865.00		
1920-21.....	109,538.56	47,000.00	62,538.56		
Supplementary.....	53,002.53		53,002.53		
Texas:					
1919-20.....	155,868.55	155,868.55			
Supplementary.....	89,924.16		89,924.16		
1920-21.....	185,843.27	185,843.27			
Supplementary.....	89,924.16		89,924.16		
Utah:					
1919-20.....	10,559.18	10,559.18			
Supplementary.....	6,091.83	6,091.83			
1920-21.....	12,589.79	12,589.79			
Supplementary.....	6,091.83	6,091.83			
Vermont:					
1919-20.....	9,852.97	9,852.97			
Supplementary.....	5,684.40			5,684.40	
1920-21.....	11,747.77	11,747.77			
Supplementary.....	5,684.40				
Virginia:					
1919-20.....	83,511.84	83,511.84			
Supplementary.....	48,179.91		48,179.91		
1920-21.....	99,571.81	99,571.81			
Supplementary.....	48,179.91	32,119.94	16,059.97		
Washington:					
1919-20.....	28,263.98	28,263.98			
Supplementary.....	16,306.14		16,306.14		
1920-21.....	33,699.36	33,699.36			
Supplementary.....	16,306.14		16,306.14		
West Virginia:					
1919-20.....	52,310.81	47,820.81	4,490.00		
Supplementary.....	30,179.31	30,179.31			
1920-21.....	62,370.58	30,000.00	32,370.58		
Supplementary.....	30,179.31		30,179.31		
Wisconsin:					
1919-20.....	70,048.27	70,048.27			
Supplementary.....	40,412.46		30,412.46	10,000.00	
1920-21.....	83,519.09	69,583.87	13,935.22		
Supplementary.....	40,412.46	40,412.46			
Wyoming:					
1919-20.....	5,413.20	5,413.20			
Supplementary.....	3,123.00				
1920-21.....	6,454.20	6,454.20			
Supplementary.....	3,123.00	3,123.00			
Total:					
1919-20.....	2,600,000.00	2,328,948.25	185,676.70	54,885.53	\$30,489.52
Supplementary.....	1,418,628.10	368,134.94	935,916.48	18,086.99	96,489.69
1920-21.....	3,099,999.05	2,560,255.95	309,224.17	124,917.66	105,601.27
Supplementary.....	1,500,000.00	334,779.43	1,021,295.93	17,434.95	126,489.69

TABLE III.—*Sources of funds for cooperative agricultural extension work, 1919-20 and 1920-21.*

State.	United States Department of Agriculture.		Smith-Lever.				State and col- lege.	County.	Other.	Total.
	Farm- ers' coop- erative demon- stration work.	Other bu- reaus.	Regular.		Supplementary.					
			Federal.	State.	Federal.	State.				
Alabama:										
1919-20.....	\$35,000	\$10,260	\$103,131	\$93,131	\$53,730	\$53,730	.....	\$20,000	.....	\$368,982
1920-21.....	35,000	3,800	121,041	111,041	53,730	53,730	.....	28,099	\$600	407,041
Arizona:										
1919-20.....	12,300	25,000	17,434	7,434	4,289	4,289	.....	12,625	41,115	124,486
1920-21.....	14,100	25,000	18,863	8,863	4,289	4,289	\$38,711	19,722	.....	133,837
Arkansas:										
1919-20.....	33,000	14,780	82,273	72,273	41,696	41,696	.....	118,384	.....	404,102
1920-21.....	33,000	5,100	96,172	86,172	41,696	41,696	.....	111,854	.....	415,690
California:										
1919-20.....	20,400	.....	57,828	47,828	27,594	27,594	68,001	120,000	.....	369,247
1920-21.....	21,300	.....	67,027	57,027	27,594	27,594	105,868	116,250	.....	422,660
Colorado:										
1919-20.....	21,600	2,300	30,768	20,768	11,982	11,982	12,050	51,878	.....	163,328
1920-21.....	24,600	2,100	34,762	24,762	11,982	11,982	10,000	62,600	2,400	185,188
Connecticut:										
1919-20.....	19,201	7,800	16,055	6,055	3,493	3,493	43,420	51,090	.....	167,789
1920-21.....	19,200	2,700	17,219	7,219	3,493	3,493	93,754	38,774	17,282	185,852
Delaware:										
1919-20.....	8,100	.....	15,544	5,544	3,199	3,199	.....	.....	.....	35,586
1920-21.....	6,600	.....	16,611	6,611	3,199	3,191	11,075	.....	4,706	52,001
Florida:										
1919-20.....	19,000	5,120	38,110	28,110	16,217	16,217	9,590	51,040	.....	183,404
1920-21.....	19,000	.....	43,516	33,516	16,217	16,217	1,100	57,390	5,000	191,956
Georgia:										
1919-20.....	40,000	17,020	119,085	109,085	62,934	62,934	.....	67,480	600	479,138
1920-21.....	40,000	6,980	140,063	130,063	62,934	62,934	.....	110,656	32,500	586,130
Idaho:										
1919-20.....	20,100	4,050	23,472	13,472	7,772	7,772	109,200	99,291	.....	285,129
1920-21.....	24,900	10,680	26,062	16,062	7,772	7,772	202,201	137,532	4,510	437,491
Illinois:										
1919-20.....	.....	.....	123,890	113,890	65,705	65,705	.....	174,305	.....	543,495
1920-21.....	.....	.....	145,791	135,791	65,705	65,705	8,000	318,405	.....	739,397
Indiana:										
1919-20.....	13,200	7,450	92,034	82,034	47,328	47,328	.....	79,183	13,326	381,881
1920-21.....	12,000	3,720	107,810	97,810	47,328	47,328	15,180	60,670	44,100	435,946
Iowa:										
1919-20.....	14,400	7,100	91,385	81,385	46,953	46,953	40,080	224,824	187,450	740,530
1920-21.....	15,000	6,940	107,036	97,036	46,953	46,953	102,525	168,267	294,500	885,210
Kansas:										
1919-20.....	10,800	5,000	73,074	63,074	36,389	36,389	50,485	46,351	.....	321,562
1920-21.....	11,466	2,200	85,203	75,203	36,389	36,389	37,018	109,144	.....	393,012
Kentucky:										
1919-20.....	35,000	3,600	101,382	91,382	52,720	52,720	.....	5,000	1,000	342,804
1920-21.....	35,000	.....	118,956	108,956	52,720	52,720	.....	.....	5,000	373,352
Louisiana:										
1919-20.....	35,000	12,931	71,109	61,109	35,255	35,255	.....	31,480	.....	282,139
1920-21.....	35,000	4,140	82,861	72,861	35,255	35,255	.....	36,783	3,200	305,355
Maine:										
1919-20.....	19,200	1,000	29,016	19,016	10,971	10,971	4,300	.....	.....	94,474
1920-21.....	19,200	.....	32,673	22,673	10,971	10,971	3,940	802	600	101,830
Maryland:										
1919-20.....	15,000	3,700	43,569	33,569	19,367	19,367	12,780	41,753	.....	189,105
1920-21.....	15,000	1,500	50,025	40,025	19,367	19,367	46,593	15,500	.....	207,377
Massachusetts:										
1919-20.....	22,800	5,620	22,700	12,700	7,327	7,327	60,926	163,600	.....	303,000
1920-21.....	23,400	1,800	25,142	15,142	7,327	7,327	83,687	238,800	.....	402,625
Michigan:										
1919-20.....	10,877	4,900	88,140	78,140	45,081	45,081	.....	93,284	.....	377,363
1920-21.....	11,490	5,280	103,167	93,167	45,081	45,081	11,860	48,999	.....	352,265
Minnesota:										
1919-20.....	13,200	6,900	74,562	64,562	37,247	37,247	63,888	121,283	980	419,869
1920-21.....	14,781	2,800	86,978	76,978	37,248	37,248	39,022	106,618	90,980	492,653
Mississippi:										
1919-20.....	35,000	23,360	93,761	83,761	48,323	48,323	.....	95,800	5,400	433,728
1920-21.....	35,000	8,930	109,869	99,869	48,323	48,323	.....	140,000	.....	490,314

8 Department Circular 140, U. S. Dept. of Agriculture.

TABLE III.—Sources of funds for cooperative agricultural extension work, 1919-20 and 1920-21—Continued.

State.	United States Department of Agricul- ture.		Smith-Lever.				State and col- lege.	County.	Other.	Total.
			Regular.		Supplementary.					
	Farm- ers' coop- erative dem- on- stra- tion work.	Other bu- reaus.	Federal.	State.	Federal.	State.				
Missouri:										
1919-20.....	\$10,800	\$7,080	\$109,815	\$99,815	\$57,585	\$57,585		\$634	\$8,400	\$351,714
1920-21.....	10,800	1,200	129,010	119,010	57,585	57,585			1,350	376,540
Montana:										
1919-20.....	21,600	27,000	22,783	12,783	7,375	7,375	\$59,842	75,000		212,458
1920-21.....	21,600	3,420	25,242	15,242	7,375	7,375	69,585	94,500		247,339
Nebraska:										
1919-20.....	12,000	3,650	56,436	46,436	26,790	26,790		42,750	17,604	232,456
1920-21.....	11,400	4,100	65,365	55,365	26,790	26,790	21,980	80,505		292,295
Nevada:										
1919-20.....	10,500	1,500	13,609	3,609	2,082	2,082		3,900	17,700	54,982
1920-21.....	11,100		14,303	4,303	2,082	2,082	26,067	12,600		72,537
New Hampshire:										
1919-20.....	16,250	1,200	19,245	9,245	5,334	5,334		36,440		93,048
1920-21.....	19,200		21,023	11,023	5,334	5,334		38,162		100,076
New Jersey:										
1919-20.....	10,533	864	43,190	33,190	19,148	19,148		70,000		196,073
1920-21.....	15,016		49,573	39,573	19,148	19,148	6,279	77,700		226,437
New Mexico:										
1919-20.....	20,119	3,300	24,791	14,791	8,533	8,533		51,391	46,373	177,834
1920-21.....	22,808	1,805	27,635	17,635	8,533	8,533	28,940	60,737	3,975	180,601
New York:										
1919-20.....	11,700	1,500	111,585	101,585	58,607	58,607	160,780	297,226		801,590
1920-21.....	10,500	3,500	131,121	121,121	58,607	58,607	160,653	384,781	41,400	970,290
North Carolina:										
1919-20.....	35,000	19,140	109,461	99,461	57,382	57,382		51,518		429,344
1920-21.....	36,000	20,420	128,589	118,589	57,382	57,382	134,801	82,450		635,613
North Dakota:										
1919-20.....	20,400	3,000	37,071	27,071	15,618	15,618	28,000	62,819		209,597
1920-21.....	25,800		42,277	32,277	15,618	15,618	29,000	81,782		242,372
Ohio:										
1919-20.....	8,400	3,800	120,745	110,745	63,891	63,891	40,356	59,384		471,212
1920-21.....	9,900	1,500	142,042	132,042	63,891	63,891	37,959	62,597	4,300	518,122
Oklahoma:										
1919-20.....	34,000	3,860	80,441	70,441	40,639	40,639		45,881	11,880	327,781
1920-21.....	34,000	4,800	93,988	83,988	40,639	40,639		100,000	20,000	418,054
Oregon:										
1919-20.....	20,400	3,480	29,267	19,267	11,116	11,116		38,065	72,920	205,631
1920-21.....	23,400	4,980	32,973	22,973	11,115	11,115	93,340	64,100		263,996
Pennsylvania:										
1919-20.....	4,200	1,800	169,873	159,873	25,000	25,000	1,200			386,946
1920-21.....	69		200,618	190,618	92,234	92,234				575,773
Rhode Island:										
1919-20.....	7,500	1,000	10,946	946	546	546	750	6,500	8,500	37,234
1920-21.....	7,500		11,128	1,128	546	546	6,116	6,200	2,188	35,352
South Carolina:										
1919-20.....	34,000	15,770	77,995	67,995	39,228	39,228	7,300	13,481		294,997
1920-21.....	32,800	11,220	91,071	81,071	39,228	39,228	7,000	57,820	550	359,988
South Dakota:										
1919-20.....	20,400		36,723	26,723	15,417	15,417	35,584	94,538	6,725	251,527
1920-21.....	23,220		41,862	31,862	15,417	15,417	33,583	81,665		243,026
Tennessee:										
1919-20.....	35,000	13,610	101,871	91,871	38,865	38,865	2,000			322,082
1920-21.....	35,000	10,580	119,539	109,539	53,003	53,003	3,000			383,664
Texas:										
1919-20.....	59,000	19,430	165,869	155,869	89,924	89,924		119,627	1	699,644
1920-21.....	59,000	7,400	195,843	185,843	89,924	89,924	10,930	243,455		882,319
Utah:										
1919-20.....	21,600	2,700	20,559	10,559	6,092	6,092	13,180	52,370	27,780	160,932
1920-21.....	23,100	600	22,589	12,589	6,092	6,092	48,450	37,102	3,050	159,664
Vermont:										
1919-20.....	18,600		19,853	9,853	5,684	5,684	21,913	15,600		97,187
1920-21.....			21,748	11,748	5,684	5,684	18,600	15,600	22,000	101,064
Virginia:										
1919-20.....	32,000	2,400	93,512	83,512	48,180	48,180		18,342	11,544	337,670
1920-21.....	32,000	1,300	109,572	99,572	48,180	48,180		66,614		405,418

¹ Estimated, budget not received.

Statistics of Cooperative Extension Work, 1920-1921. 9

TABLE III.—Sources of funds for cooperative agricultural extension work, 1919-20 and 1920-21—Continued.

State.	United States Department of Agriculture.		Smith-Lever.				State and col- lege.	County.	Other.	Total.
			Regular.		Supplementary.					
	Farm- ers' coop- erative dem- on- stra- tion work.	Other bu- reaus.	Federal.	State.	Federal.	State.				
Washington:										
1919-20...	\$21,600	\$9,020	\$38,264	\$28,264	\$16,306	\$16,306	.....	\$82,738	.....	\$212,498
1920-21...	25,800	.....	43,699	33,699	16,306	16,306	.....	99,734	\$24,482	260,026
West Virginia:										
1919-20...	19,000	3,600	62,311	52,311	30,179	30,179	\$20,779	39,059	.....	257,418
1920-21...	19,000	2,000	72,371	62,371	30,179	30,179	39,000	.....	.....	255,100
Wisconsin:										
1919-20...	8,100	2,000	80,048	70,048	40,412	40,412	20,882	21,983	.....	283,885
1920-21...	10,200	2,000	93,519	83,519	40,412	40,412	.....	25,002	.....	295,064
Wyoming:										
1919-20...	15,900	1,500	15,413	5,413	3,123	3,123	66,457	26,134	.....	137,063
1920-21...	19,500	.....	16,454	6,454	3,123	3,123	57,023	27,060	.....	132,737
Total:										
1919-20...	984,780	295,795	3,080,000	2,600,000	1,418,627	1,418,627	965,503	2,994,031	496,583	14,253,944
1920-21...	1,006,750	174,497	3,580,000	3,100,000	1,500,000	1,500,000	1,630,980	3,727,031	611,391	16,830,649

10 *Department Circular 140, U. S. Dept. of Agriculture.*

TABLE IV.—*Total of funds from all sources for cooperative agricultural*

State.	Total.	Administration.	Printing and distribution of publications.	County agent.	Home economics.	Extension schools.	Boys' clubs.	Pig clubs.	Poultry clubs.	Animal husbandry.	Poultry.	Dairying.
Ala.:												
1919-20..	\$368,982	\$18,800	\$3,800	\$186,452	\$91,331	\$1,000	\$8,600	\$4,080	\$1,399			\$5,600
1920-21..	407,041	18,510	4,000	208,310	117,271	1,600	4,930		1,700	\$5,240		3,960
Ariz.:												
1919-20..	124,486	9,888	1,240	32,436	12,243		10,107					
1920-21..	133,837	8,744	1,300	35,802	17,400	7,380	12,241					
Ark.:												
1919-20..	404,102	26,529	4,046	213,479	125,208	1,500		4,900		3,220	\$2,800	\$6,500
1920-21..	415,690	31,181	6,000	200,965	133,844					5,400	4,200	4,500
Calif.:												
1919-20..	369,247	23,500		239,390	62,220		26,270					
1920-21..	422,660	28,300		292,920	62,588		27,880				3,800	
Colo.:												
1919-20..	163,328	10,370		100,020	12,415		13,655			4,000		
1920-21..	185,188	12,990	1,200	105,864	13,280		23,130			4,480		
Conn.:												
1919-20..	167,789	14,010	1,040	36,280	37,767		29,230			4,800	4,000	3,660
1920-21..	185,852	20,201		42,300	37,651	2,450	20,200			3,850	8,500	5,250
Del.:												
1919-20..	35,586	6,706	1,054	12,900	7,700		5,000					
1920-21..	52,001	14,996		15,720			12,650				200	
Fla.:												
1919-20..	183,404	10,205	3,201	77,470	67,725		14,383			4,420	2,400	
1920-21..	191,956	10,540	3,696	91,137	71,261	1,000	7,460			3,682	2,700	
Ga.:												
1919-20..	479,138	24,800	11,000	215,898	143,520	8,500	13,940		3,000	6,500		9,400
1920-21..	586,130	36,100	10,000	272,222	185,608		6,900		3,900	8,100		6,600
Idaho:												
1919-20..	285,129	19,540	3,000	128,580	42,420	2,900	50,550			14,460		7,320
1920-21..	437,491	31,260	3,600	154,365	50,768	1,200	62,059			17,100		7,740
Ill.:												
1919-20..	543,495	15,995	5,000	404,600	74,500		15,000			6,000		5,200
1920-21..	739,397	15,247	4,000	569,250	91,200		27,700			7,100		7,000
Ind.:												
1919-20..	381,881	16,304	2,500	259,357	20,510		20,460			7,440	6,320	10,180
1920-21..	435,946	15,755	2,500	302,568	23,065	8,680	17,798			12,600	7,686	11,580
Iowa:												
1919-20..	740,530	47,540	13,333	479,227	71,954		25,800			11,600	8,300	14,476
1920-21..	885,210	30,100	11,400	589,300	95,020		51,500			14,900	13,340	12,200
Kans.:												
1919-20..	321,562	12,000	1,200	177,554	34,670	14,993	16,061			5,674	3,140	5,673
1920-21..	393,012	16,939		222,520	44,863	10,420	23,400			7,600	3,400	6,800
Ky.:												
1919-20..	342,804	31,151	4,000	145,073	92,000	4,000	15,900			9,060	9,200	4,600
1920-21..	373,352	27,006	6,000	132,036	108,260	4,600	24,440			13,200	9,400	12,100
La.:												
1919-20..	282,139	14,520	3,565	151,994	63,628		10,740			5,900	3,521	8,260
1920-21..	305,355	19,050	5,000	146,125	76,410		12,450			6,840	4,760	7,040
Me.:												
1919-20..	94,474	14,903	1,200	47,150	15,211	800	6,990			2,540	2,420	
1920-21..	101,830	15,060	800	49,590	17,090	800	7,040			1,850	2,720	3,140
Md.:												
1919-20..	189,105	24,214	3,500	77,993	43,418		7,600			6,200	3,200	3,400
1920-21..	207,377	24,450	4,500	81,607	54,380	2,500	8,040			3,800	3,100	3,500
Mass.:												
1919-20..	303,000	21,210	3,900	140,840	51,210	500	27,290	2,800	1,550	7,180	6,320	5,390
1920-21..	402,625	18,820	4,340	110,252	95,846	1,395	101,114			6,150	5,835	6,715
Mich.:												
1919-20..	377,363	14,390		202,167	48,925	3,400	38,850			6,535	5,835	3,000
1920-21..	352,265	14,850	3,000	169,721	38,912		46,287			8,500	7,600	
Minn.:												
1919-20..	419,869	29,060	3,500	278,929	44,340	1,620	15,830			2,700	4,420	16,190
1920-21..	492,653	20,487	6,840	349,208	49,880	940	23,260	2,600		4,850	4,850	12,970
Miss.:												
1919-20..	433,725	15,080	5,700	220,846	114,140	3,290	20,972			9,820		15,230
1920-21..	490,314	15,200	7,500	224,142	137,042		29,950			11,900	3,500	11,000
Mo.:												
1919-20..	351,714	15,400	6,000	171,926	62,578		24,180			11,880	5,890	7,510
1920-21..	376,540	15,040	6,520	202,720	49,754		18,200			15,600	8,350	6,940
Mont.:												
1919-20..	212,458	19,783	1,500	100,875	47,400	6,000	6,700			2,390	2,000	3,300
1920-21..	247,339	10,344	3,500	132,890	39,050	9,300	11,950			4,350	3,900	4,230
Nebr.:												
1919-20..	232,456	11,393	2,000	147,695	24,225		17,710			3,110	2,740	2,980
1920-21..	292,295	15,945	8,880	159,440	30,500		20,120			3,440	7,140	2,840

Statistics of Cooperative Extension Work, 1920-1921. 11

extension work for two years ending June 30, 1921, by projects.

Animal diseases.	Agronomy.	Horticulture.	Botany and plant pathology.	Entomology, apiculture, ornithology.	Forestry.	Agricultural engineering.	Farm management.	Rural organization.	Marketing.	Exhibits and fairs.	Farmers' institutes.	Correspondence courses.	Miscellaneous specialists.	Rodent pests.
\$7,350 2,550	\$8,560 4,140	\$6,090 6,970	\$1,600 1,060	\$4,490 2,900		\$3,600 3,360	\$3,000 3,300		\$7,800 10,040				\$5,430 7,200	
										\$150 150			7,922	\$50,500 50,820
		3,400 4,380					4,120 1,800		8,400 20,920		\$2,500			
							2,700 3,200						15,167 3,972	
	3,190 4,390						3,700 4,330		10,810 10,600				5,168 4,924	
	3,100 4,750	1,900 4,650		2,600 2,150			8,300 6,000		12,000 16,400	1,500 1,500	1,000		6,602 4,000	
		937 3,650	3,750										1,239 1,035	
3,600 480														
3,700 4,500		6,680 7,600	2,500	2,500	\$3,000	5,400 6,800	11,600 14,800		4,200 13,500	3,000 5,000			4,500	
	4,425 11,940	3,900 4,380	3,558	3,720 11,850			3,900						4,314 38,911	34,860
	7,700 7,900	3,500 4,500					6,000 5,500							
	7,360 9,120	8,620 7,020	5,600 6,840	3,270		3,100 3,600	5,640 6,540				5,220			
6,850 5,100	18,750 14,300	9,250 15,100		2,400 4,950		9,050 9,700	10,100 10,200		8,800 8,100				3,100	
4,100 3,000	5,840 7,150	2,260 1,750		2,407 4,850		9,950 10,770	3,200 3,850	\$5,340 5,580				\$17,530 20,090		
2,900 3,650	4,120 3,500	4,700 6,700				3,100 4,700	3,040 9,600		9,960 8,160					
	700	8,200 16,080		2,500 3,000					3,600 4,300				9,311	
							3,260 3,740							
								1,900	1,380					
	3,100 3,440	3,300 6,630	2,960 3,060	5,060 5,780	300 300	3,480								
	4,690 5,065	3,800 11,985	580 780		430	450	4,640 5,185	3,900	6,080 10,425	4,750	500	4,640 5,090	10,380 3,595	
	7,600 18,075	13,785 13,300	5,800	4,101	2,800	3,000 4,400	3,660 5,200		7,935 14,800				11,441 1,820	
	1,490 1,400	1,410 2,340	3,120 3,080				9,460 6,898	2,400 3,050	3,000				2,400	
		5,600 10,750		3,700 7,560		7,700 10,000	6,340		5,400 21,470					
3,250 1,400	8,150 19,780	3,610 4,325		4,325		3,460 3,690	4,290 4,440		4,400 8,440				19,190 7,016	
	3,000 4,150		400 425				3,700 4,200		5,500 2,950	1,000	700		14,400	10,000
2,400 3,900	4,760 6,400			1,265 1,900		3,320 7,790	2,950 4,300		2,400 5,200				3,608 8,500	

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TABLE IV.—Total of funds from all sources for cooperative agricultural

State.	Total.	Administration.	Printing and distribution of publications.	County agent.	Home economics.	Extension schools.	Boys' clubs.	Pig clubs.	Poultry clubs.	Animal husbandry.	Poultry.	Dairying.
Nev.:												
1919-20..	\$54,982	\$6,744	\$800	\$17,119	\$10,500	.....	\$13,219	.....	.....	.....	.....	\$3,200
1920-21..	72,537	7,064	300	31,433	15,360	.....	11,080	.....	.....	\$3,900	.....	3,400
N. H.:												
1919-20..	93,048	8,341	1,100	52,814	17,483	.....	5,930	.....	.....	.....	.....	3,580
1920-21..	100,076	10,129	1,600	49,007	17,320	.....	14,940	.....	.....	.....	.....	3,460
N. J.:												
1919-20..	196,073	14,748	2,800	93,741	25,926	.....	32,439	.....	.....	.....	\$4,120	5,700
1920-21..	226,437	15,494	2,000	94,312	43,314	.....	40,134	.....	.....	.....	5,100	7,650
N. Mex.:												
1919-20..	177,834	15,562	1,980	110,526	16,292	.....	24,974	.....	.....	.....	.....	.....
1920-21..	180,601	13,291	3,064	110,050	16,055	.....	24,936	.....	.....	.....	.....	.....
N. Y.:												
1919-20..	801,590	33,336	25,130	383,871	152,719	\$57,991	30,801	.....	.....	14,240	12,290	4,950
1920-21..	970,290	28,347	29,900	452,968	187,329	55,308	74,020	.....	.....	19,630	16,330	7,275
N. C.:												
1919-20..	429,344	16,665	10,446	202,775	94,738	.....	2,700	.....	.....	12,550	.....	15,100
1920-21..	635,613	19,730	12,725	271,488	158,090	.....	.....	.....	.....	27,770	.....	13,800
N. Dak.:												
1919-20..	209,597	20,975	500	112,867	18,870	.....	25,590	.....	.....	.....	.....	.....
1920-21..	242,372	24,385	4,250	127,765	24,172	1,000	33,495	.....	.....	3,900	1,700	.....
Ohio:												
1919-20..	471,212	54,452	2,800	238,460	36,841	1,210	23,200	.....	.....	7,640	6,100	7,940
1920-21..	518,122	47,690	8,600	248,240	40,926	1,210	43,140	.....	.....	7,480	7,730	8,960
Okla.:												
1919-20..	327,781	19,986	5,296	157,943	103,203	.....	18,183	.....	\$6,840	.....	.....	6,250
1920-21..	418,054	23,560	2,456	193,899	130,800	.....	17,800	.....	.....	.....	8,050	4,400
Oreg.:												
1919-20..	205,631	20,398	3,000	105,914	17,350	3,050	26,269	.....	.....	4,100	300	8,000
1920-21..	263,996	20,772	3,000	138,224	25,375	3,600	32,025	.....	.....	4,675	3,975	9,550
Pa.:												
1919-20..	386,946	20,406	14,000	193,050	65,020	.....	8,000	.....	.....	11,750	8,100	18,320
1920-21..	575,773	23,758	8,810	276,399	98,062	.....	12,650	.....	.....	18,550	17,800	32,380
R. I.:												
1919-20..	37,234	4,778	564	16,496	6,100	.....	5,600	.....	.....	.....	.....	2,500
1920-21..	35,352	4,333	648	15,253	7,498	.....	6,940	.....	.....	.....	.....	680
S. C.:												
1919-20..	294,997	24,215	5,900	95,997	104,884	.....	7,851	.....	.....	10,000	1,925	12,250
1920-21..	359,988	24,340	4,700	91,250	128,662	.....	7,870	.....	.....	8,833	2,125	14,250
S. Dak.:												
1919-20..	251,527	12,227	3,000	176,480	10,480	5,000	19,680	.....	.....	3,800	.....	.....
1920-21..	243,026	12,222	3,247	158,742	11,055	4,360	23,590	.....	.....	4,000	.....	.....
Tenn.:												
1919-20..	322,082	28,650	9,687	141,097	91,918	4,950	3,580	.....	3,700	10,866	.....	6,856
1920-21..	383,664	31,330	11,454	151,046	136,144	8,060	4,300	.....	3,670	11,660	.....	8,540
Texas:												
1919-20..	699,644	34,110	11,087	360,110	160,312	.....	4,920	.....	.....	16,430	6,950	4,628
1920-21..	882,319	34,390	13,460	415,107	191,735	.....	5,150	.....	.....	13,500	7,600	9,550
Utah:												
1919-20..	160,932	10,080	800	83,660	22,570	.....	20,460	.....	.....	.....	.....	3,300
1920-21..	159,664	12,514	600	80,500	32,900	.....	19,750	.....	.....	.....	.....	.....
Vt.:												
1919-20..	97,187	6,577	500	49,550	24,580	.....	9,405	.....	.....	.....	600	2,600
1920-21..	101,064	6,577	500	51,445	26,562	.....	9,405	.....	.....	.....	600	2,600
Va.:												
1919-20..	337,670	26,030	5,238	177,568	81,534	.....	9,840	.....	.....	6,300	3,700	6,500
1920-21..	405,418	29,630	8,814	210,573	95,101	.....	8,380	.....	.....	7,000	7,900	13,300
Wash.:												
1919-20..	212,498	12,920	2,000	96,024	28,833	2,000	35,825	.....	.....	3,650	.....	6,100
1920-21..	260,026	18,274	2,000	128,100	36,742	.....	36,330	.....	.....	3,800	4,000	6,080
W. Va.:												
1919-20..	257,418	24,601	5,650	117,112	37,690	2,060	27,630	.....	.....	9,270	2,500	5,060
1920-21..	255,100	24,505	6,870	107,704	37,700	4,100	23,821	.....	.....	7,947	3,917	5,600
Wis.:												
1919-20..	283,885	16,698	7,500	139,957	10,250	19,100	7,900	.....	.....	11,490	3,600	12,600
1920-21..	295,064	19,005	11,628	142,467	20,532	9,390	11,820	.....	.....	12,597	5,500	13,810
Wyo.:												
1919-20..	137,063	14,560	2,000	57,364	22,374	200	25,641	.....	.....	3,540	3,508	3,408
1920-21..	132,737	11,470	600	56,603	26,670	.....	28,864	.....	.....	650	2,960	2,160
Total:												
1919-20..	14,253,944	914,350	207,057	7,429,596	2,571,725	143,974	831,355	\$11,780	16,489	260,199	126,199	276,711
1920-21..	16,830,649	949,955	245,802	8,463,639	3,149,647	139,293	1,103,139	2,600	9,270	326,424	210,862	303,553

¹ Estimated, budget not received.

extension work for two years ending June 30, 1921, by projects—Continued.

Animal diseases.	Agromony.	Horticulture.	Botany and plant pathology.	Entomology, apiculture, ornithology.	Forestry.	Agricultural engineering.	Farm management.	Rural organization.	Marketing.	Exhibits and fairs.	Farmers' institutes.	Correspondence courses.	Miscellaneous specialists.	Rodent pests.
\$3,400														
							\$3,800						\$4,250	
	\$3,240	\$9,100					3,620							
	4,650	12,700											1,083	
3,700									\$3,600				1,200	
3,805									4,000				5,400	
	22,130	11,280	\$10,630	\$7,700	\$4,100	\$9,530	12,020		4,860	\$3,150			862	
	17,320	15,740	16,730	13,250	4,525		13,820	\$9,775	5,440				2,583	
650	15,040	5,100	3,000	2,640	3,200	2,800	3,500		22,050	5,480	\$8,460		2,450	
22,800	17,000	6,400	3,600	6,300	5,200	10,870	4,000		40,010	15,830				
4,500	1,400	1,450	1,500	3,500		2,750	3,500						23,595	
							4,100						2,505	
3,100	19,740	10,150	3,560	3,400		8,553	7,166				27,360	\$3,620	5,920	
	14,660	11,879	3,700	4,300		11,460	19,010		3,700		28,585	3,660	3,192	
		3,540				3,540	3,000							
		3,700				3,200			26,600				2,989	\$600
	4,200	4,000		1,000			3,700							
	8,775	4,975					4,475		4,350					
									4,575					
	9,050	7,900	10,150	4,500			3,700						13,000	
	19,000	10,540	16,600	5,300	1,100		7,590		10,000				17,234	
	450												746	
	7,100	8,950	3,050	2,875				1,925	3,700				4,375	
	9,067	12,000	600	6,400				2,125	45,600				2,166	
3,700	3,800	3,500				3,700	3,760						2,400	
5,320	5,520	1,650		4,000		4,000	5,320							
	3,856	2,770			400	3,796			6,916				3,040	
	4,700				400	4,000			8,360					
2,400			20,642					15,279					62,776	
			24,890					11,747	145,550				9,640	
	1,000													
					400		1,500	350	2,900	2,800	700		10,812	
							3,700	75	1,200	800	3,850		3,375	
		300												
		300						3,075						
								3,075						
	3,960	9,600				2,800							4,600	
	3,400	10,620	2,400		200	6,100							2,000	
	3,300	3,300	2,800	2,860			2,900		2,600				4,586	2,800
	4,000	3,600	3,200	2,900		3,300	3,600						4,100	
2,100	4,720	8,000	1,230		1,450			2,595		4,230	1,520			
2,450	5,267	8,000	2,050					7,699		6,270	1,200			
	15,020	3,960	4,870			9,690							21,250	
	17,489	5,978	5,896	1,950		11,184	3,975	1,843						
	3,468									200	400			400
	2,360									100	100			200
50,800	213,549	187,152	76,692	62,987	15,250	99,569	151,261	27,889	149,041	13,480	67,000	10,480	271,193	67,400
60,255	257,608	248,042	109,519	97,165	12,555	122,124	183,268	47,694	449,640	32,630	39,455	33,890	156,140	86,480

14 *Department Circular 140, U. S. Dept. of Agriculture.*

TABLE V.—*Funds available for cooperative agricultural extension work, classified by original sources.*

Source of funds.	1914-15	1915-16	1916-17	1917-18
Federal Government:				
Farmers' cooperative demonstration work.....	\$905,782.00	\$900,389.92	\$958,333.87	\$951,333.82
Other bureaus.....	105,168.40	165,172.01	185,893.15	507,282.95
Federal Smith-Lever—				
Emergency.....				2,940,072.48
Regular.....	474,934.73	1,077,923.73	1,575,054.38	2,068,066.29
Total.....	1,485,885.13	2,143,485.66	2,719,281.40	6,475,755.54
Within the State:				
State and college—				
Offset—				
Smith-Lever.....		497,484.18	952,114.31	1,313,330.47
Other.....	1,044,270.38	872,733.90	832,114.16	881,091.25
Total.....	1,044,270.38	1,370,218.08	1,784,228.47	2,194,421.72
County—				
Offset—				
Smith-Lever.....		69,226.79	94,556.74	215,077.20
Other.....	780,331.79	973,251.56	1,258,296.14	1,863,632.29
Total.....	780,331.79	1,042,478.35	1,352,852.88	2,078,709.49
Miscellaneous:				
Offset—				
Smith-Lever.....		31,212.76	48,383.33	59,658.62
Other.....	286,748.55	276,786.09	244,873.55	494,219.38
Total.....	286,748.55	307,998.85	293,256.88	553,878.00
Total within the States.....	2,111,350.72	2,720,695.28	3,430,338.23	4,827,009.21
Grand total.....	3,597,235.85	4,864,180.94	6,149,619.63	11,302,764.75

Source of funds.	1918-19	1919-20 ¹	1920-21 ¹
Federal Government:			
Farmers' cooperative demonstration work.....	\$966,596.57	\$984,780.00	1,006,750.00
Other bureaus.....	935,373.64	295,795.00	174,497.00
Federal Smith-Lever—			
Emergency.....	4,598,243.13		
Regular.....	2,538,828.04	3,080,000.00	\$3,580,000.00
Supplementary.....		1,418,627.00	1,500,000.00
Total.....	9,039,041.38	5,779,202.00	6,261,247.00
Within the State:			
State and college—			
Offset—			
Smith-Lever.....	1,586,066.42	2,383,833.78	2,685,173.61
Supplementary.....		386,221.93	352,214.38
Other.....	901,828.49	965,503.00	1,630,980.00
Total.....	2,487,894.91	3,735,558.71	4,668,367.99
County—			
Offset—			
Smith-Lever.....	316,367.59	185,676.70	309,224.17
Supplementary.....		935,916.48	1,021,295.93
Other.....	2,291,209.30	2,994,031.00	3,727,031.00
Total.....	2,607,576.89	4,115,624.18	5,057,551.10
Miscellaneous:			
Offset—			
Smith-Lever.....	156,394.03	30,489.52	105,601.27
Supplementary.....		96,489.69	126,489.69
Other.....	370,653.29	496,583.00	611,391.00
Total.....	527,047.32	623,562.21	843,481.96
Total within the States.....	5,622,519.12	8,474,745.10	10,569,401.05
Grand total.....	14,661,560.50	14,253,947.10	16,830,648.05

¹Allotments.

TABLE VI.—Number of counties with agents.

State.	Agricultural counties.	Counties with men agents.						Counties with women agents.							
		July 1, 1914.	July 1, 1915.	July 1, 1916.	July 1, 1917.	July 1, 1918.	July 1, 1919.	July 1, 1920.	July 1, 1914.	July 1, 1915.	July 1, 1916.	July 1, 1917.	July 1, 1918.	July 1, 1919.	July 1, 1920.
Alabama.....	67	67	67	65	62	66	65	55	18	19	27	28	67	54	32
Arizona.....	14	14	14	6	7	11	11	10	.....	.....	.....	.....	3	6	6
Arkansas.....	75	45	52	53	61	68	66	58	15	20	31	47	65	58	42
California.....	45	4	11	13	17	33	35	35	.....	.....	.....	.....	24	8	10
Colorado.....	35	13	13	19	16	29	27	24	.....	.....	2	.....	.....	3	2
Connecticut.....	8	1	6	7	8	8	8	8	.....	.....	.....	.....	5	6	6
Delaware.....	3	.....	3	3	2	3	3	3	.....	.....	.....	.....	1	3	2
Florida.....	54	25	36	33	37	53	47	32	24	27	28	35	54	42	29
Georgia.....	152	80	81	83	117	120	134	97	29	48	45	57	125	93	66
Idaho.....	34	2	3	7	11	27	32	34	.....	.....	.....	.....	24	4	5
Illinois.....	102	14	18	20	22	53	63	81	.....	.....	1	.....	88	17	11
Indiana.....	92	27	31	32	40	83	76	68	.....	.....	.....	.....	22	8	5
Iowa.....	99	9	11	16	26	97	99	99	.....	.....	.....	.....	96	23	19
Kansas.....	105	9	39	56	53	67	53	51	.....	.....	.....	.....	14	8	9
Kentucky.....	120	28	39	47	45	90	71	53	9	19	24	27	96	74	18
Louisiana.....	64	41	43	43	42	58	55	41	13	13	18	20	33	32	24
Maine.....	16	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	2	5
Maryland.....	23	8	13	16	23	22	23	22	5	6	10	13	22	23	21
Massachusetts.....	13	1	10	9	11	13	13	11	.....	.....	.....	1	6	12	10
Michigan.....	84	11	17	22	30	71	63	60	.....	.....	1	1	24	13	12
Minnesota.....	86	27	23	19	16	85	86	82	.....	.....	.....	.....	39	8	8
Mississippi.....	81	48	49	44	53	79	75	71	33	33	32	49	71	64	53
Missouri.....	114	13	15	14	15	71	52	47	.....	.....	.....	.....	48	20	11
Montana.....	41	4	8	7	12	23	24	27	.....	.....	.....	.....	18	11	9
Nebraska.....	93	5	8	9	8	79	54	39	.....	.....	.....	2	30	10	7
Nevada.....	15	.....	.....	.....	6	8	4	6	.....	.....	1	.....	10	5	5
New Hampshire.....	10	1	5	8	9	10	10	9	.....	.....	.....	2	9	6	3
New Jersey.....	19	4	7	11	10	17	18	18	.....	.....	1	.....	8	5	8
New Mexico.....	26	.....	8	9	11	25	26	22	.....	.....	.....	.....	11	5	4
New York.....	57	25	29	36	41	56	55	55	.....	.....	.....	1	3	38	24
North Carolina.....	100	51	64	65	69	91	87	77	27	34	44	48	72	66	59
North Dakota.....	51	17	15	15	17	38	32	28	.....	.....	.....	2	33	5	4
Ohio.....	75	8	10	12	20	63	65	63	.....	.....	1	.....	13	5	2
Oklahoma.....	77	40	56	59	62	77	70	73	19	24	22	23	50	46	40
Oregon.....	35	10	12	13	14	24	23	26	.....	.....	.....	.....	15	5	5
Pennsylvania.....	67	10	14	22	45	53	40	54	.....	.....	1	.....	48	.....	.....
Rhode Island.....	5	.....	.....	4	4	5	4	4	.....	.....	.....	.....	4	.....	2
South Carolina.....	45	43	43	42	40	43	45	45	21	24	31	36	44	45	45
South Dakota.....	66	3	5	11	13	59	36	39	.....	.....	.....	.....	42	3	3
Tennessee.....	96	36	38	48	57	91	76	45	18	21	31	49	94	77	41
Texas.....	250	98	99	90	92	178	168	127	26	27	38	31	67	69	55
Utah.....	28	8	10	8	15	28	22	21	.....	.....	2	2	14	4	4
Vermont.....	14	7	9	11	13	13	13	12	.....	.....	.....	.....	7	5	6
Virginia.....	100	53	55	51	53	75	71	57	17	22	25	38	52	36	28
Washington.....	37	7	10	13	22	34	29	32	.....	.....	.....	.....	22	6	8
West Virginia.....	55	13	27	29	45	48	48	40	5	10	12	12	33	22	12
Wisconsin.....	71	9	12	13	22	59	41	42	.....	.....	.....	.....	17	4	2
Wyoming.....	21	3	6	8	13	15	13	14	.....	.....	.....	.....	5	7	7
Total.....	2,940	928	1,136	1,225	1,436	2,435	2,247	2,033	279	350	430	537	1,715	1,049	784

16 *Department Circular 140, U. S. Dept. of Agriculture.*TABLE VII.—*Kind and number of extension workers, 1917–1921.*

Kind of agent.	July 1, 1917.	Jan. 1, 1918.	July 1, 1918.	Jan. 1, 1919.	July 1, 1919.	Jan. 1, 1920.	July 1, 1920.	Oct. 1, 1920.
COUNTY AGENT WORK.								
<i>South.</i>								
Directors and State leaders.....	29	27	27	26	29	29	29	28
Assistant State leaders and district agents.....	55	73	80	73	79	69	62	60
County agents and assistants.....	888	1,078	1,156	1,114	1,124	916	809	832
Local agents (colored).....	66	105	142	148	177	151	158	151
Total.....	1,038	1,283	1,405	1,361	1,409	1,165	1,118	1,091
<i>North and West.</i>								
Directors and State leaders.....	33	33	36	31	33	31	31	31
Assistant State leaders.....	25	26	203	91	78	78	65	60
County agents and assistants.....	563	1,009	1,357	1,291	1,288	1,108	1,145	1,170
Total.....	621	1,068	1,596	1,413	1,399	1,217	1,241	1,261
<i>United States.</i>								
Directors and State leaders.....	62	60	63	57	62	60	60	59
Assistant State leaders.....	80	99	283	164	157	147	127	120
County agents and assistants.....	1,451	2,087	2,513	2,405	2,412	2,024	2,014	2,022
Local agents (colored).....	66	105	142	148	177	151	158	151
Total.....	1,659	2,351	3,001	2,774	2,808	2,382	2,359	2,352
HOME DEMONSTRATION WORK.								
<i>South.</i>								
State leaders.....	13	14	14	15	13	15	15	15
Assistant State leaders and district agents.....	33	60	57	77	82	73	77	75
County agents.....	513	749	883	722	763	596	564	560
Local agents (colored).....	7	71	175	134	250	51	74	68
City agents.....	.....	65	83	64	50	.....	.....	.....
City agents (colored).....	.....	8	19	15	7	.....	.....	.....
Total.....	566	967	1,231	1,027	1,165	735	730	718
<i>North and West.</i>								
State leaders.....	7	47	47	34	34	29	28	29
Assistant State leaders.....	.....	30	47	47	41	43	29	22
County agents.....	20	307	602	462	433	214	242	248
City agents.....	.....	57	107	109	101	11	10	11
Total.....	27	441	803	652	609	297	309	310
<i>United States.</i>								
State leaders.....	20	61	61	49	47	44	43	44
Assistant State leaders and district agents.....	33	90	104	124	123	116	106	97
County agents.....	533	1,056	1,485	1,184	1,196	810	806	808
Local agents (colored).....	7	71	175	134	250	51	74	68
City agents.....	.....	122	190	173	151	11	10	11
City agents (colored).....	.....	8	19	15	7	.....	.....	.....
Total.....	593	1,408	2,034	1,679	1,774	1,032	1,039	1,028
BOYS' AND GIRLS' CLUB WORK.								
<i>South.</i>								
State leaders.....	24	19	18	21	41	32	40	35
Assistant State leaders.....	.....	33	.....	.....	.....	.....	.....	.....
County leaders.....	31	27	67	44	64	21	37	34
Total.....	55	79	85	65	105	53	77	69
<i>North and West.</i>								
State leaders.....	30	28	27	29	23	28	26	29
Assistant State leaders.....	33	68	134	95	89	73	66	57
County leaders.....	130	270	935	256	469	230	273	257
Total.....	193	366	1,096	380	581	331	365	343
<i>United States.</i>								
State leaders.....	54	47	45	50	64	60	66	64
Assistant State leaders.....	33	101	134	95	89	73	66	57
County leaders.....	161	297	1,002	300	533	251	310	291
Total.....	248	445	1,181	445	686	384	442	412
SUMMARY OF TOTAL.								
County agent work.....	1,659	2,351	3,001	2,774	2,808	2,382	2,359	2,352
Home demonstration work.....	593	1,408	2,034	1,679	1,774	1,032	1,039	1,028
Boys' and girls' club work.....	248	445	1,181	445	686	384	442	412
Grand total.....	2,500	4,204	6,216	4,898	5,268	3,798	3,840	3,792

ACT OF 1914 PROVIDING FOR COOPERATIVE EXTENSION WORK.

[Smith-Lever Act.]

AN ACT To provide for cooperative agricultural extension work between the agricultural colleges in the several States receiving the benefits of an act of Congress approved July second, eighteen hundred and sixty-two, and of acts supplementary thereto, and the United States Department of Agriculture.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to aid in diffusing among the people of the United States useful and practical information on subjects relating to agricultural and home economics, and to encourage the application of the same, there may be inaugurated in connection with the college or colleges in each State now receiving, or which may hereafter receive, the benefits of the act of Congress approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts" (Twelfth Statutes at Large, page five hundred and three), and of the act of Congress approved August thirtieth, eighteen hundred and ninety (Twenty-sixth Statutes at Large, page four hundred and seventeen and chapter eight hundred and forty-one), agricultural extension work which shall be carried on in cooperation with the United States Department of Agriculture: *Provided*, That in any State in which two or more such colleges have been or hereafter may be established the appropriations hereinafter made to such State shall be administered by such college or colleges as the legislature of such State may direct: *Provided further*, That, pending the inauguration and development of the cooperative extension work herein authorized, nothing in this act shall be construed to discontinue either the farm management work or the farmers' cooperative demonstration work as now conducted by the Bureau of Plant Industry of the Department of Agriculture.

SEC. 2. That cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise; and this work shall be carried on in in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this act.

SEC. 3. That for the purpose of paying the expenses of said cooperative agricultural extension work and the necessary printing and distributing of information in connection with the same, there is permanently appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$480,000 for each year, \$10,000 of which shall be paid annually, in the manner hereinafter provided, to each State which shall by action of its legislature assent to the provisions of this act: *Provided*, That payment of such installments of the appropriation hereinbefore made as shall become due to any State before the adjournment of the regular session of the legislature meeting next after the passage of this act may, in the absence of prior legislative assent, be made upon the assent of the governor thereof, duly certified to the Secretary of the Treasury: *Provided further*, That there is also appropriated an additional sum of \$600,000 for the fiscal year following that in which the foregoing appropriation first becomes available, and for each year thereafter for seven years a sum exceeding by \$500,000 the sum appropriated for each preceding year, and for each year thereafter there is permanently appropriated for each year the sum of \$4,100,000 in addition to the sum of \$480,000 hereinbefore provided: *Provided further*, That before the funds herein appropriated shall become available to any college for any fiscal year plans for the work to be carried on under this act shall be submitted by the proper officials of each college and approved by the Secretary of Agriculture. Such additional sums shall be used only for the purposes hereinbefore stated, and shall be allotted annually

to each State by the Secretary of Agriculture and paid in the manner hereinbefore provided, in the proportion which the rural population of each State bears to the total rural population of all the States as determined by the next preceding Federal census: *Provided further*, That no payment out of the additional appropriations herein provided shall be made in any year to any State until an equal sum has been appropriated for that year by the legislature of such State, or provided by State, county, college, local authority, or individual contributions from within the State, for the maintenance of the cooperative agricultural extension work provided for in this act.

SEC. 4. That the sums hereby appropriated for extension work shall be paid in equal semiannual payments on the first day of January and July of each year by the Secretary of the Treasury upon the warrant of the Secretary of Agriculture, out of the Treasury of the United States, to the treasurer or other officer of the State duly authorized by the laws of the State to receive the same; and such officer shall be required to report to the Secretary of Agriculture, on or before the first day of September of each year, a detailed statement of the amount so received during the previous fiscal year, and of its disbursement, on forms prescribed by the Secretary of Agriculture.

SEC. 5. That if any portion of the moneys received by the designated officer of any State for the support and maintenance of cooperative agricultural extension work, as provided in this act, shall by any action or contingency be diminished or lost or be misapplied, it shall be replaced by said State to which it belongs, and until so replaced no subsequent appropriation shall be apportioned or paid to said State, and no portion of said moneys shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings, or the purchase or rental of land, or in college-course teaching, lectures in colleges, promoting agricultural trains, or any other purpose not specified in this act, and not more than five per centum of each annual appropriation shall be applied to the printing and distribution of publications. It shall be the duty of each of said colleges annually, on or before the first day of January, to make to the governor of the State in which it is located a full and detailed report of its operations in the direction of extension work as defined in this act, including a detailed statement of receipts and expenditures from all sources for this purpose, a copy of which report shall be sent to the Secretary of Agriculture and to the Secretary of the Treasury of the United States.

SEC. 6. That on or before the first day of July in each year after the passage of this act the Secretary of Agriculture shall ascertain and certify to the Secretary of the Treasury as to each State whether it is entitled to receive its share of the annual appropriation for cooperative agricultural extension work under this act, and the amount which it is entitled to receive. If the Secretary of Agriculture shall withhold a certificate from any State of its appropriation, the facts and reasons therefor shall be reported to the President, and the amount involved shall be kept separate in the Treasury until the expiration of the Congress next succeeding a session of the legislature of any State from which a certificate has been withheld, in order that the State may, if it should so desire, appeal to Congress from the determination of the Secretary of Agriculture. If the next Congress shall not direct such sum to be paid, it shall be covered into the Treasury.

SEC. 7. That the Secretary of Agriculture shall make an annual report to Congress of the receipts, expenditures, and results of the cooperative agricultural extension work in all of the States receiving the benefits of this act, and also whether the appropriation of any State has been withheld, and if so, the reasons therefor.

SEC. 8. That Congress may at any time alter, amend or repeal any or all of the provisions of this act.

Approved, May 8, 1914 (38 Stat. L., 372)

Cooperative Extension Work in Agriculture and Home Economics

United States Department of Agriculture and State
Agricultural Colleges Cooperating

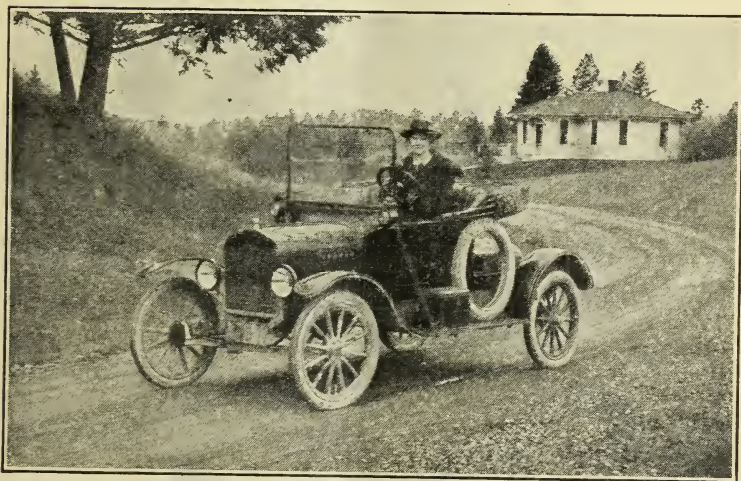
STATUS AND RESULTS OF HOME DEMONSTRATION WORK

NORTHERN AND WESTERN STATES

1919

FLORENCE E. WARD

In Charge Extension Work with Women



Home demonstration agent starting on a field trip

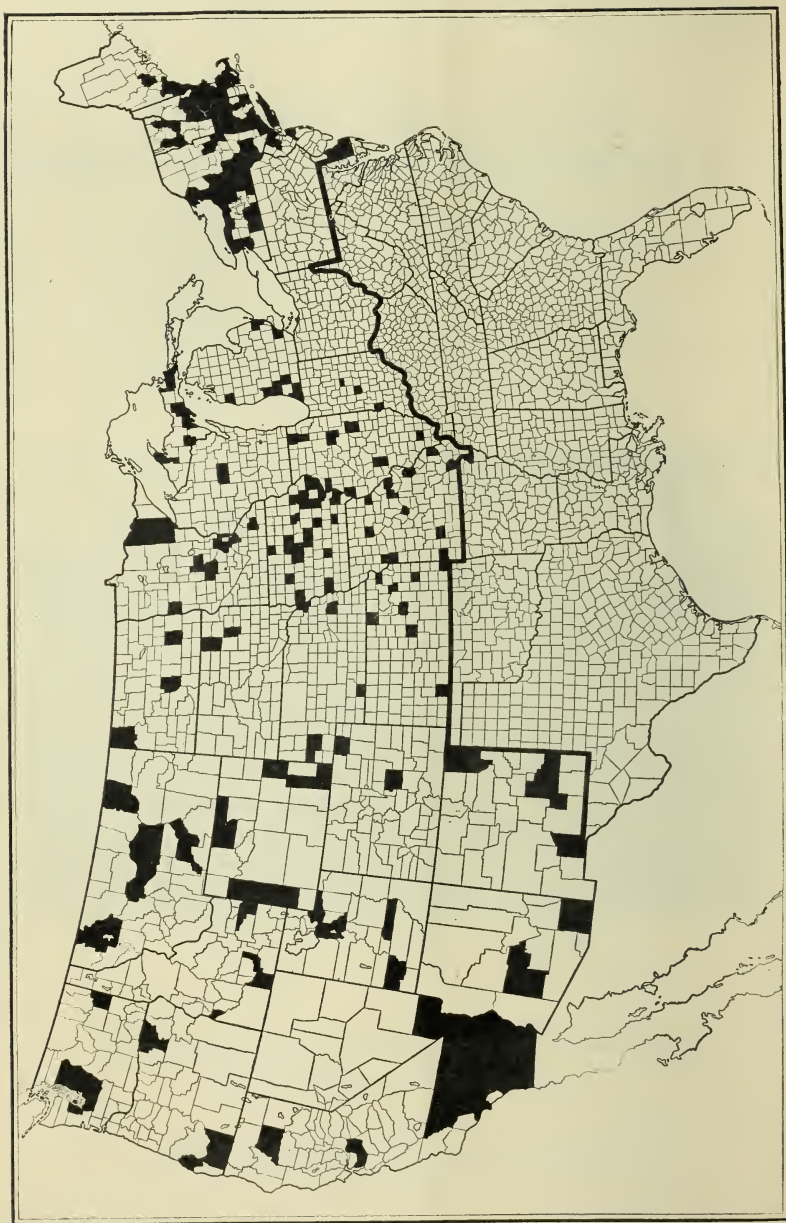
UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 141

Contribution from the States Relations Service

A. C. TRUE, Director

Washington, D. C.

January, 1921



Map showing distribution of home demonstration work in the Northern and Western States.

HOME DEMONSTRATION WORK IN THE NORTH- ERN AND WESTERN STATES, 1919.

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EARLY DEVELOPMENT.

Home demonstration work is one phase of the nation-wide system of extension service carried on by the State agricultural colleges in cooperation with the United States Department of Agriculture under authority granted by Congress in the cooperative agricultural extension act of May 8, 1914, known as the Smith-Lever Act, and supported jointly by Federal, State, agricultural college, county, and local funds.

The following table shows the number of workers employed in the 33 Northern and Western States from 1916 to 1920 and approximately the amount of funds from all sources for home demonstration work:

Number of home demonstration workers cooperatively employed June 30 each year and total funds appropriated.

Item.	1916	1917	1918	1919	1920
Workers.....	4	28	803	609	286
Funds.....	\$7,383.33	\$50,042.33	\$1,270,675	\$1,593,400	\$747,300

The advent of the home demonstration agents who represent this work in the counties of the 33 Northern and Western States is comparatively recent. The work actually began in Erie County, N. Y., in August, 1914, when Miss Mills was appointed home demonstration agent on State funds. The second appointment was that of

Miss Gertrude M. McCheyne, who began work in Box Elder County, Utah, May 1, 1915. Other agents appointed on State funds were Miss Minnie Price, who began work in Hampden County, Mass., in July, 1915, and Miss Eva Benefiel, who was appointed in Kankakee County, Ill., in August of the same year.

On May 2, 1916, Miss Sarah Pettit was cooperatively employed by the United States Department of Agriculture and the State College of Agriculture of New York to continue the work started some months previously in Erie County. About the same time Miss Kathryn E. Woods was appointed as a home demonstration agent in Sullivan County, N. H. Miss McCheyne was reappointed in Box Elder County and Mrs. Edith Charlton Salisbury was cooperatively employed in Maricopa County, Ariz. The following agents were also placed during the year 1916: New York, Miss Florence Freer, Otsego County, August 1; Miss May Wells, Cortland County, September 1; Mrs. Viola Godfrey, Jefferson County, September 1. New Hampshire, Miss Kathleen Calkins, Cheshire County, August 1. Massachusetts, Mrs. Florence Warner, Worcester County, July 1; Miss Margaret Howard, Franklin County, August 1; Miss Elsie Trabue, Barnstable County, October 21.

While no definite plan was formulated in the extension departments of the State agricultural colleges for carrying on the work of these women, the underlying purpose which prompted their appointment was the building up and improvement of the rural home along lines similar to those which were being followed in the development of the farm. The specific activities to be undertaken in the counties and how they should be carried on were left largely to the discretion of the home demonstration agents and the local women with whom they were associated. It was logical and reasonable in the minds of the extension directors who made these first appointments that in order to develop the best type of agriculture throughout the States the problems of the farm home should be considered at the same time and on the same basis as those of the farm.

During the war there was a rapid increase of home demonstration workers employed in the States expressly to help housewives in their part of the war program. In that period about 800 home demonstration agents were employed in the Northern and Western States, largely with Federal emergency funds. After the withdrawal of these funds at the close of the war the number of appointments was reduced until at the end of the fiscal year, June 30, 1920, 219 home demonstration agents and 69 State workers were covering 227 counties in the North and West.

As this form of extension work becomes better known throughout the country and as its value increases in the life of the rural com-

munities the home demonstration agent is being looked upon as a permanent factor in the county in which she works. One of the factors underlying the success of this movement in its present state of development is that the work has required the linking together of the practical knowledge of the housewife with the technical knowledge of the home demonstration agent and the home economics specialists; the extent to which this plan is carried out in the communities largely determines its permanency.

PERMANENT DEVELOPMENT.

On June 30, 1917, there were 28 home demonstration agents and on June 30, 1918, there were 803 home demonstration workers, leaders, and agents, cooperatively employed, and working in cities, districts, and counties. On June 30, 1919, the number of home demonstration workers had decreased to 609. This reduction, due largely to the withdrawal of emergency funds at the close of the war, resulted in almost complete discontinuance of the work in cities. The lack of support from those counties which had looked upon the work as of a temporary character and had made no efforts toward permanent local organization also tended to reduce the number of agents.

June 30, 1920, found the service with a well-organized force of 286 trained workers employed in the 33 States, on funds available from Federal, State, and local sources, amounting to \$747,360.79, of which \$97,335 was from United States Department of Agriculture funds and \$282,125.72 was voluntarily appropriated by the counties and the farm bureaus, the county appropriations ranging from \$500 to \$1,500 each. Although the force of workers was in one year reduced almost one-half and the State and Federal funds were reduced nearly one-half, the appropriations made by the local people for home demonstration work have almost doubled and every agent is retained in her present location in direct response to requests from the people whom she serves.

DUTIES OF HOME DEMONSTRATION AGENTS.

The fundamental purpose of home demonstration work is to assist the rural housewife to apply common business principles to her daily tasks for the purpose of making the farm home as efficient as the farm, thereby producing a more satisfactory and permanent type of rural life.

Home demonstration agents afford an avenue by which the State agricultural colleges and the United States Department of Agriculture offer the practical results of their research and experiments in home economics to the housewives of the county. They also en-

courage the rural housewives to bring from their store of practical knowledge and experience the lessons they have learned in home management that will be valuable to other women in the community, and they help to make this information available to all. The home demonstration agent is a teacher who makes liberal use of the practical demonstration rather than the lecture or textbook. The most successful home demonstration agents aim to train local leaders who, by putting the best practices into their own homes, extend the instruction to larger numbers of women.



FIG. 1.—Home demonstration work develops leadership. The agent plays the part of interested spectator while the local poultry project leader, whom she has trained, demonstrates to a group of women interested in poultry improvement how to clean and pack eggs to secure the best prices. The poultry project is among the most popular with farm women since it yields money for home improvements and other needs.

QUALIFICATIONS OF THE HOME DEMONSTRATION AGENT.

The requirements for appointment as a home demonstration agent (in the North and West) vary somewhat in the different States. Graduation from college, or an institution of equivalent standing, is a usual though not an absolute requirement, except in a few of the States. Special training in home economics is required in all cases. Of the 286 home demonstration workers employed cooperatively on Federal and State funds June 30, 1920, 93 per cent had special training in home economics and 98 per cent had college training. Most of the States require practical experience in housekeeping, and a preference is given to the applicant who is familiar with

rural home conditions. There is no arbitrary age limit, but the records show that only 3 per cent of the home demonstration agents are under 25 years of age, 36 per cent are between 25 and 30 years, and the largest number, about 61 per cent, are between the ages of 30 and 45 years.

As important as it is that the home demonstration agent should know the science of home economics and have had an intimate experience with rural home making, there are certain other qualifications classed under the broad term of "personality" that are of equal if not greater importance. The chief qualifications of a successful home demonstration agent include tact and good judgment, an abundance of good health, the ability to look on the bright side of things, faith and zeal in her mission, poise, and never-failing patience and common sense.

EQUIPMENT FOR HOME DEMONSTRATION WORK.

The home demonstration agent whose calendar of work is properly outlined plans to spend at least two-thirds of her time with the farm women in their homes discussing the varied problems of house-keeping and of such home industries as gardening, poultry raising, and the like.

The majority of the home demonstration agents use automobiles for travel about the country. A few use the stage, the electric inter-urban car, or the railroad. In some cases they plan their itinerary to correspond with that of the county agricultural agents so that the two may make their trips to the community in the same auto. The most satisfactory arrangement is for the home demonstration agent to have an automobile for her exclusive use.

Home demonstration agents are rarely, if ever, located in counties which do not employ county agricultural agents. With one or two exceptions in States having separate organizations for different lines of extension work, the home demonstration agent shares offices with the county agricultural agent and other extension workers. The home demonstration agent's equipment varies somewhat with her length of service and the amount of funds available for her local expenses. Generally, however, she has for her personal use the usual office equipment, such as a desk, filing cabinets, camera, demonstration outfit and supplies, and shares the services of the stenographer and the telephone with the other workers. The rule prevailing in most States is that the home demonstration agent shall have at least one regular office day each week during which she can be consulted by any one interested in home demonstration work. A second day in the week is generally set aside for office work, such as regular correspondence and the keeping of records.

PLACE OF HOME DEMONSTRATION WORK IN THE EXTENSION PROGRAM.

Although home demonstration work is the most recent development in the agricultural extension plan, it has now a permanent part in the county extension program, and the home demonstration agents have a well-defined function in the extension machinery of the county, State, and Nation. The character of their work is as broad and varied as are the needs of the rural people among whom they work. During the first two years of their service in the counties their first duty as representatives of the State agricultural colleges and United States Department of Agriculture was to extend the teaching of the home economics departments of the agricultural colleges and the United States Department of Agriculture to the home makers and to others who were unable to receive this instruction through regular college channels. The fact that rural women are as a class unused to cooperating in household affairs and have not always been conscious of their needs, or have failed to express them, may be one reason why a traveler from Maine to California passes so many farm homes in which the housekeeping methods and equipment remain much the same as they were 50 years ago.

People very generally are beginning to realize that better and more permanent agriculture requires that the farm home be equipped with modern conveniences and labor-saving appliances quite as much as that there be improved equipment in the barn, better live stock, and more thorough cultivation of the soil. Better health, more equal division between the hours of work and the hours of leisure, the apportioning of the farm income to secure a larger share of those things which mean comfort and contentment for the family are among the awakening desires of the rural people and are included in the program of work which farm people are hoping the home demonstration agent will assist them in carrying out.

HOW TO SECURE A HOME DEMONSTRATION AGENT.

Any county organized for extension work which desires the appointment of a home demonstration agent should first communicate with the extension service at the State agricultural college or with the agricultural agent in the county. In this way assistance in starting the work can be obtained from the State leader of home demonstration agents, or the extension specialist in organization. The requirements to be met by the counties vary somewhat in each State to conform to State laws. Usually an initial step on the part of the local people is to have a petition signed by a certain percentage of the farm women sent to the State college through the farm bureau. Experience has taught that it is not wise to appoint a home demon-

stration agent in a county until public sentiment favorable to her service exists among the rural people, and the county commissioners or the board of supervisors are prepared to contribute to her local support. When this time has arrived and the State requirements have been met, the State leader of home demonstration agents or the State director of extension will set about securing an agent who is qualified to meet the requirements of the county.

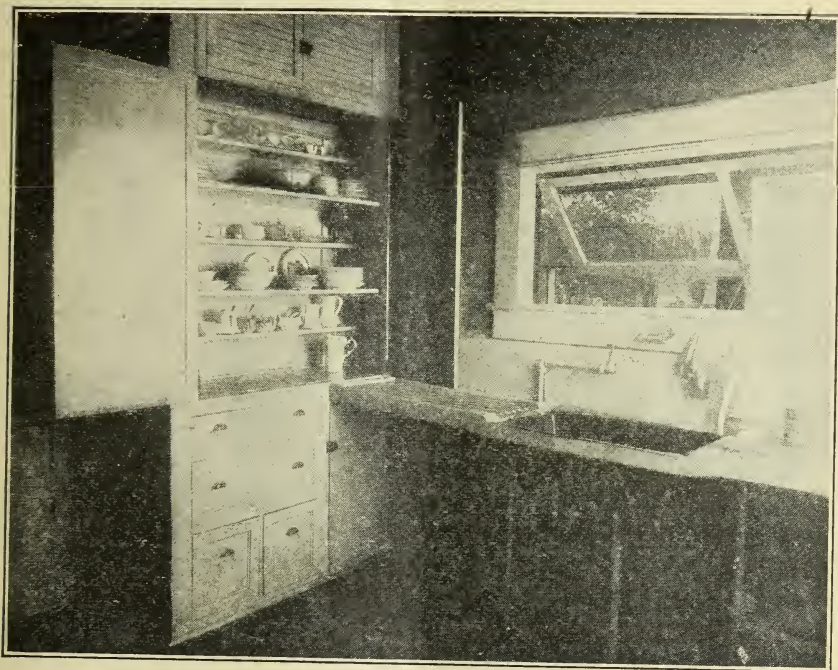


FIG. 2.—Home demonstration agents help take the drudgery out of housework. The cheerful outlook for the woman behind the dish pan and the step-saving cupboard arrangement were worked out in consultation with the agent of Anderson County, Kansas. The man who remodeled this kitchen for his wife has since entirely remodeled one kitchen and helped remodel several others for interested neighbors.

FINANCING HOME DEMONSTRATION WORK.

The salary and expenses of the county home demonstration agent are derived from Federal, State, and local sources as follows:

- (1) Money appropriated by Congress to the United States Department of Agriculture for farmers' cooperative demonstration work.
- (2) Money available to the States for cooperative extension work under the provisions of the Smith-Lever Extension Act of 1914.
- (3) Appropriations by State legislatures usually to State agricultural colleges either specifically for home demonstration work or for general extension work.

(4) Appropriations by county commissioners or boards of supervisors.

(5) In a few of the States money is raised through a membership fee in the county farm bureau to assist in defraying some part of the home demonstration agent's salary or expenses.

The average salary of a home demonstration agent in the North and West is \$1,545 and the average total county appropriation is \$735, the maximum being \$1,800 and the minimum \$50. There is a wide range of salaries in the various States, the minimum being \$1,140 and the maximum \$2,500. The contribution from the United States Department of Agriculture does not exceed \$600 for a home demonstration agent and \$1,500 for a State leader of home demonstration agents. The appropriation by the State agricultural colleges from Smith-Lever funds at present ranges from \$120 to \$2,800 annually for the support of work in a county. The increased appropriation for home demonstration work in the future from any source no doubt will be determined by the development of the work in the counties and the desire of the local people for additional home demonstration agents. The general trend in the financing of this work seems to contemplate an annual appropriation of \$1,200 from State and Federal sources, the remaining expenses to be contributed by the farm bureau or other extension organizations in the county.

ADMINISTRATION AND SUPERVISION.

Home demonstration work is conducted according to the terms of a project agreement arranged between the extension division of the State agricultural college and the States Relations Service of the United States Department of Agriculture. The work in the States is administered by an extension director and is directly supervised by a leader of home demonstration agents and her assistants, who are also employees of the State agricultural college and the United States Department of Agriculture.

There now exists in the majority of the 33 Northern and Western States a county organization commonly called the "farm bureau," through which the various lines of extension work are carried on. For the last two years there has been a definite effort on the part of the State extension divisions to have the home demonstration agents carry on their work through the farm bureaus. In 1917 and until the signing of the armistice there was a pronounced tendency to use the various war organizations rather than the county farm bureau for furthering the home demonstration work, but in preparing to make extension work with women permanent the advisability of connecting it with the other extension activities in the county became apparent.

ORGANIZATION FOR WORK IN COUNTIES.

The majority of the 33 Northern and Western States have within the last two years adopted what is popularly known as the "family" or "new" farm bureau. This organization is an association of people interested in rural affairs. Membership in it comprises men, women, and young people. There is generally a uniform membership fee of \$1 per year. In a few States there is a preference for a family membership fee ranging from \$5 to \$10. The county executive committee and the community committees of this organization are composed of both men and women. Each of the members of the community committees is appointed primarily to lead a definite line of work.

In 22 States some type of farm bureau has been established, in which women share equally with the men the privileges and responsibilities of the organization. In three or four States home demonstration work is carried on by an organized group auxiliary to the farm bureau or independent of it. In New York the organizations are brought together in a "State Association of Farm and Home Bureaus," and in this State a federation of home bureaus has recently been formed, the first of its kind in the country. In Illinois county extension work is carried on in three county-wide organizations, one of which is the home bureau. In this State county appropriations are made specifically for each line of work; each bureau conducts its own business and carries out its special program of work. In California the farm bureau is a federation of community groups, termed community centers, and extension work is carried on in departments, one of which is the farm home department.

On June 30, 1920, 231 counties were organized for home demonstration work and had some association with the farm bureau; the membership of women was reported as 78,264. Idaho, Montana, Wyoming, and New Hampshire furnish the best examples of the possibilities of the "family" or "new" farm bureau. In these States the organization is a vital part of the county; the interests of the farm, the home, and the community function through it. This type of organization is proving practical and is bringing about large and far-reaching results in benefiting the farm home and the rural community, and it is believed offers advantages over the type of organization which segregates the people into groups with separate plans and separate aims.

An obstacle in the development of the "family" type of farm bureau, however, has been that farm women, owing to inexperience in public matters, hesitate at first to express their opinions and desires on county and community executive boards, with the result that the home problems are frequently not adequately represented on

the program of work. These difficulties rarely continue through the second year of organization and are generally overcome by time, patience, and the abiding faith of the home demonstration agent who believes that home and family are common interests with both men and women and that the problems of health, efficiency, and comfort are more effectively solved when considered and worked out together. Such problems of the farm home as water supply, sewage disposal, heating, lighting, ventilating, and household conveniences are best handled where the men and women are working them out together.

When functioning fully the farm bureau promotes four outstanding features in the interests of the rural home: First, a definite pro-



FIG. 3.—Extension work capitalizes the instinct of imitation. Home demonstration agents arrange "farm home tours" so that men and women may study the best the county affords in household equipment, kitchen arrangement, house furnishing, and the planting of the home grounds. At each home visited the host and hostess explain the special feature of interest and discuss cost and value. Specialists from the college frequently contribute to the educational features of the tour.

gram of work formulated by the local people after a study of home and community problems, in which they are assisted by the agricultural and home demonstration agents and the specialists in agriculture and home economics provided by the State college of agriculture; second, local people, selected because of their interest and fitness to lead in special lines of work; third, demonstrations in the home by the housewives of definite principles of home management for the purpose of multiplying the services of the agent; and fourth, the checking of results of projects and demonstrations which are being carried on and noting the influence of these demonstrations as it spreads from community to community.

MAKING COUNTY AND COMMUNITY PROGRAMS AND DEVELOPING LOCAL LEADERS.

The general plan throughout the Northern and Western States has been to build the county farm bureau program from programs worked out in the various communities. While this phase of extension work is yet in its infancy, 5,619 communities reported the adoption of home projects for 1919. Some of the counties which have adopted a program of work to include home activities are yet without home demonstration agents. In these units the women have organized local committees, appointed local leaders, and with the assistance of the county agricultural agent, the State leader of home demonstration agents, and specialists from the agricultural college, they are carrying on demonstrations among themselves until such time as local funds are available to employ home demonstration agents.

When a home demonstration agent begins work in a county under the auspices of the farm bureau, or other extension organization, she consults first with the leaders of the home activities on the county executive board, if such activities have been adopted. These leaders are usually influential women in the county who have the interests of the home and the community at heart. From these leaders she hopes to obtain information regarding the problems which have been selected for general work throughout the county.

The specific lines of work to be followed are usually selected by the communities in consultation with the home demonstration agent. The methods of securing these community programs vary, but experience has taught that the local interest is more genuine and on the whole results are more satisfactory when a small group of interested men and women of the community meet with the home demonstration agent and the county agricultural agent to talk over the immediate farm and home problems and their relation to the community. Informal discussion of the sources of income from the farm and community, and of the chief activities of the women in the home, generally elicits information regarding the important lines of work to be undertaken and also suggests local people qualified to act as volunteer leaders in the program of work. This informal meeting is followed by a conference between the home demonstration agent and the women who have been chosen to lead the home activities in the community and together they work out a plan of what is to be done, what demonstrations are to be given, when and where, and in what homes certain definite things will be demonstrated by the housewives to show their value and practicability in the community.

Finding these local leaders and the women who will act as demonstrators in their homes, in other words, developing local leadership,

and assisting the women to discover their latent ability, is the home demonstration agent's most important work. The more earnestly she performs this duty, and the more successful she is in developing in the local people a capacity for leadership, the more successful and permanent will home demonstration work become in the county. The value of local leadership in promoting home demonstration work has only been foreshadowed. As a means of reaching many people whom the agent single handed could never hope to serve, this local leadership has unlimited possibilities.

The popular demonstrations of cooking and sewing, common in former years, have been largely abandoned by home demonstration agents. The most successful demonstrations that were held in 1919 were those in which the home demonstration agent met a small group of women, sometimes in a farm home, on other occasions in the community meeting place, and discussed with them certain phases of home making. These small meetings have proved the most efficient means of extending the influence of the lesson to be taught. They are the initial step in the demonstration. The second and more important step is taken when these women return to their homes and put the teachings of the home demonstration agent to practical test. The third step which completes the demonstration is taken when the teachings of the home demonstration agent become the usual practice in the homes of the community.

ACTIVITIES DIRECTED BY HOME DEMONSTRATION AGENTS.

Among the special lines of work that were generally carried on throughout the North and West in 1919 were various phases of home management, the production and preservation of food, the planning of meals, care of children, home care of the sick, making and remodeling clothing, improving home surroundings, and various community enterprises.

The reported results in these lines are creditable, but at best they are an inadequate measure of the value of the work which has been accomplished. There are indirect and intangible benefits accruing from each one of them which are often of greater value in the communities than those that can be expressed.

HOME MANAGEMENT AND CONVENIENCES.

Because of the rise in prices of all kinds of household commodities and the decrease in the purchasing power of the dollar, interest in the business side of housekeeping was intensified among rural home makers. As a result, under the influence and guidance of the home demonstration agent, 166 counties in 28 States of the North and West included some phase of home management in their programs of work.

The greatest interest on the part of the local women seems to center on more and better labor-saving equipment and better arranged kitchens. Home demonstration agents report that last year the kitchens in 1,169 farm homes were rearranged, 659 washing machines were purchased, and 1,452 pressure and steam cookers were bought

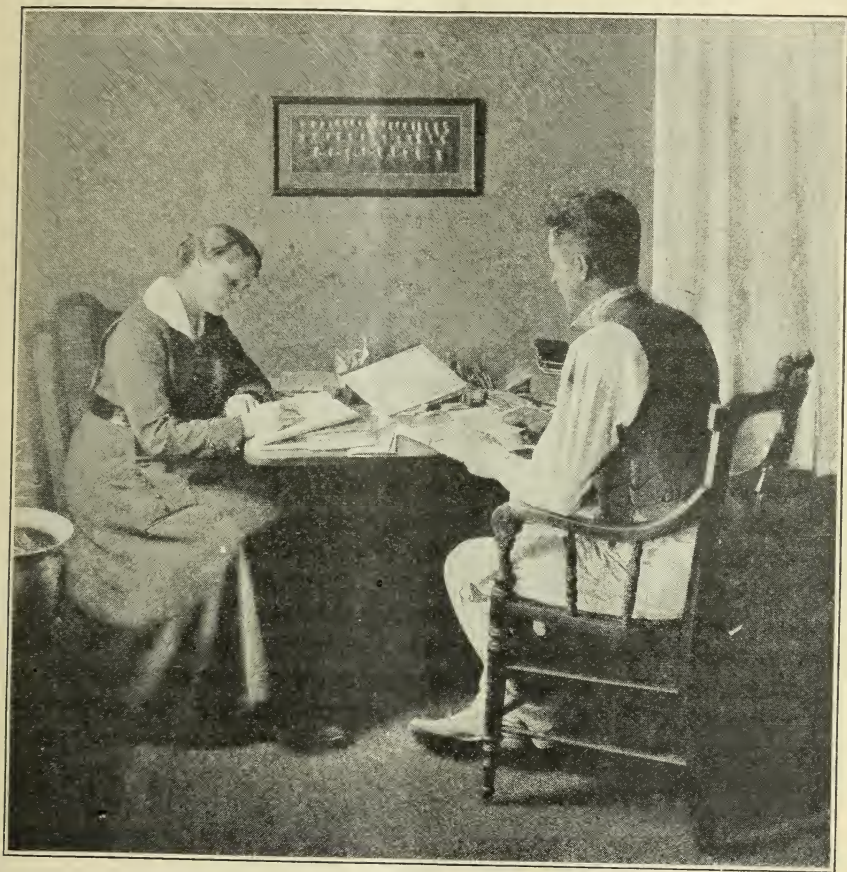


FIG. 4.—Home demonstration agents train housewives to become efficient purchasing agents. The present era of high prices puts a premium on modern business methods in the home. Household accounts, rightly kept, reveal losses due to unwise purchasing methods and make it possible to work out a budget to guide future expenditures. The household accounts project has helped hundreds of families to materially reduce expenses.

to lighten the labor of cooking. In 473 rural homes water systems were installed, nearly one-half the number being in New York State. Excellent results from this kind of work are also reported from Illinois, Missouri, and Colorado.

In 33 counties in 22 States household accounting formed an important part of the home program. In Massachusetts 700 account books were distributed to housewives who requested them from the

home demonstration agents, and in Utah 209 women made a systematic study of budgets and accounts throughout the year.

FOOD PRODUCTION.

As a result of the effort to increase the home production of food-stuffs, 31,460 gardens were planted in 1919, the products from which were valued at \$421,911. The most striking examples of interest in this line of work were reported from some of the desert sections in the West, where, before the advent of the home demonstration agent and the county agricultural agent, home gardens were rarely found. In almost every State some phase of poultry work was conducted, such as culling the farm home flock, securing better stock, feeding and care of poultry, and grading and packing eggs. In this work 3,212 flocks were culled, eliminating 107,445 nonlaying hens, thereby lessening the cost of egg production by \$102,815 and thus increasing the farm woman's profits. Goat raising and apiculture for women were included in the home demonstration agent's program last year.

FOOD PRESERVATION.

Reports for 1919 show a decrease in food preservation in community canneries, but as a home industry it was probably carried on as extensively as during the war.

The reports made by the home demonstration agents in 1919 in many instances do not include the individual work of the local women but are generally limited to products that were preserved as a direct result of the agent's instruction and to some extent under her supervision. The results reported are 1,894,099 quarts of canned fruits and vegetables, 443,621 quarts of jams and jellies, and 386,989 pounds of dried fruits and vegetables, of an estimated total value of \$873,084.

A phase of food preservation in the home which can be directly traced to the work of the home demonstration agent is that of canning meat, poultry, and fish, which is reported from 26 States. Reports show that 63,989 quarts of poultry, 55,047 quarts of beef, and 25,676 quarts of pork of an estimated value of \$117,349, were canned in 1919. Other meats such as sausage, game, and fish amounting to 136,618 pounds and of an estimated value of \$40,448 were preserved for home use. The value of eggs preserved and sold is estimated at \$346,396.

FOOD FOR THE FAMILY.

This phase of home demonstration work has been reported variously under the title of food selection and meal planning, child welfare, child feeding, hot school lunch, and milk campaigns. As a

rule the work has taken the form of a county-wide farm bureau project and has required cooperation with State, county, and local doctors and nurses, also with existing health and child welfare organizations, as well as with the school system. The program includes the weighing, measuring, and physical examination of children of pre-school age and of school children at their respective schools or in groups. Follow-up work is carried on with the assistance of individual home demonstrators, in nutrition classes, and in milk lunch groups at schools.

One State reports 233 communities adopting work of this kind in 1919, carrying it out with the assistance of 168 local leaders. Hot lunches were established in 2,386 schools in 169 counties. More and better milk was introduced in the diet of children. The total number

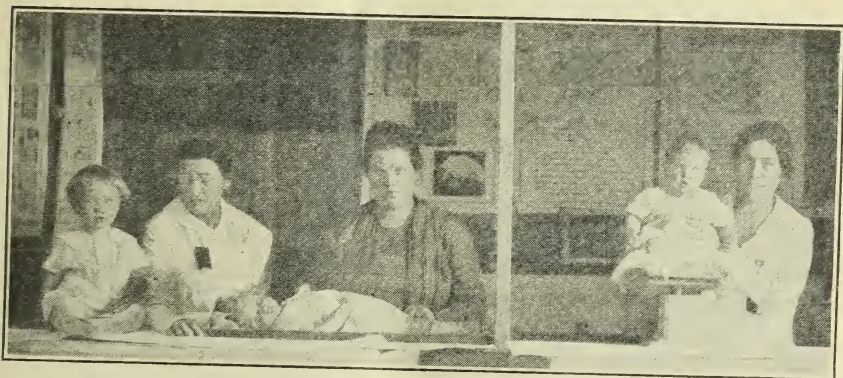


FIG. 5.—Home demonstration agents teach how to cultivate the most precious crop on the farm. A booth at the county fair, Big Horn County, Wyo., where children were weighed, measured, and scored. Weighing and measuring tests frequently reveal an astonishing amount of malnutrition in prosperous rural communities and lead to practical follow-up work in child-feeding demonstrations in individual homes and through the school lunch. Where the cooperation of State and local doctors and nurses is available their help is enlisted.

of children reached through the hot school lunch was 60,022. It is reported that 5,223 children showed a marked improvement in mental alertness and health as a result of the introduction of the lunch at school and the increased use of milk at home. Wiser selection of food in meal planning was emphasized in 268 counties.

In New York, Minnesota, Missouri, Kansas, Montana, Wyoming, Utah, and other States, mothers and children are being enrolled for specific child feeding demonstrations. Ninety-three counties report families feeding and caring for children according to the directions of the home demonstration agents. This by no means represents the total number of children whose feeding has been improved by means of the nutrition work carried on under the direction of the home demonstration agents.

INCREASING THE USE OF MILK AND MILK PRODUCTS.

This project had its inception in the desire to increase the use of skimmed milk in order that more meat and other less perishable foods might be available during the war period. Another contributing factor was the better-baby campaigns, which were a part of the health crusades conducted by State and local health officials. In both of these activities the home demonstration agent played an important part. From these beginnings has developed a definite piece of work, the plan of which falls under two headings, namely, (1)

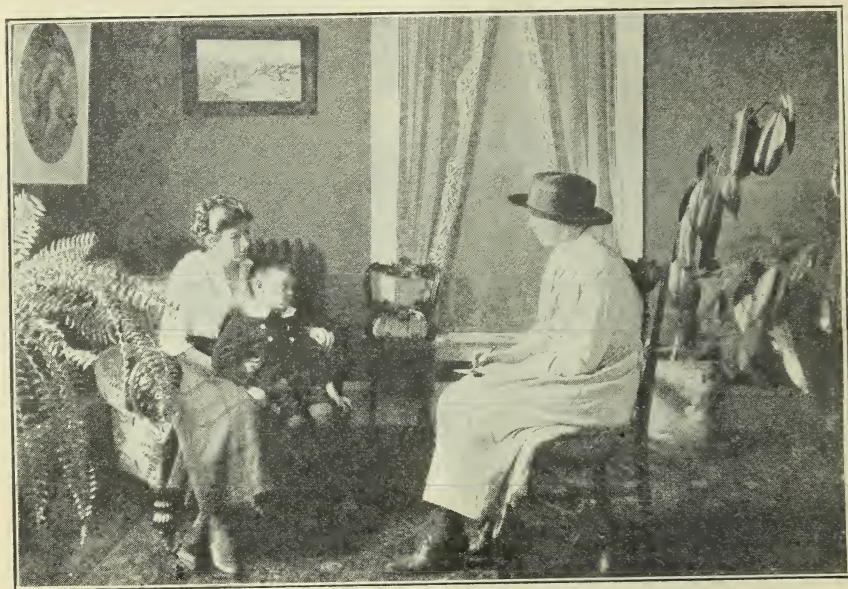


FIG. 6.—The agent's training in dietetics makes her a reliable guide in problems of child feeding. Mothers who find their children underweight are eager to learn whether they are giving them the right food. The picture shows a visit of supervision to a mother who has enrolled her boy for a child feeding demonstration.

an increased use of milk and milk products in the home or school, and (2) the home manufacture of milk products.

In order to encourage the greater use of milk and milk products, the home demonstration agent has taken part in establishing milk stations, conducting milk campaigns, introducing milk lunches in schools, and giving milk-feeding demonstrations. To increase home production of milk products, the home demonstration agent taught the making and use of cottage cheese and the making of Cheddar and goat's milk cheese.

The interest in this line of work is steadily increasing. Plans for 1920 indicate more intensive work in milk campaigns and milk-feeding demonstrations in both the home and the school. Two economic problems are closely connected with this work, that of the large

surplus of milk in certain districts of the country during certain seasons of the year, and the lack of a sufficient and clean milk supply in other localities.

In connection with this work 635 local women were given special training in home butter and cheese making. Cottage and other cheeses were made in the home to the amount of 395,718 pounds, valued at \$69,035. As a direct result of the home demonstration work showing the value of milk and butter as food, the total increase in the home use of milk reported from 12 States was 1,049,015 quarts and of butter 1,028,644 pounds.

HOME NURSING.

More than 3,500 talks and demonstrations were given in 1919 on strictly health subjects by the home demonstration agents, who also made about 2,000 visits to homes where instruction in the home care of sick was required.

The epidemic of influenza during the winter of 1918-19 stimulated an interest in the rudiments of home care of the sick. As a result 202 counties reported definite programs in home nursing, personal hygiene, and sanitation in 1919. Home demonstration agents gave instruction to 31,729 families in home care of the sick, and 16,000 families laid in emergency supplies.

Idaho reported in 1919 that the county nurse was a member of the farm bureau staff, so that three counties in the State had home health nurses supervised from the extension office in the agricultural college by the State home health specialist, who was a registered nurse.

In several of the States employing registered nurses as home health specialists on the State extension staff, emphasis is being placed on prenatal care, with the result that the local health leaders in certain sections are sending into the home demonstration agents the names of women in their communities who need information on this subject.

Massachusetts reported that home demonstration agents had cooperated with the State department of health under the guidance of one of its woman physicians as general leader of the health project. Each home demonstration agent in developing her work in the health project consulted with the department's physician and registered nurse in her respective health district. In five counties in Massachusetts the farm bureau was instrumental in securing needed dental clinics in isolated rural communities. In Worcester County the farm bureau purchased a dentist's chair and part of the necessary dental equipment, the purpose being to provide a means of caring for the children's teeth.

CLOTHING.

Demonstration work in garment making and remodeling was conducted in practically all of the 33 Northern and Western States. It

was carried out in three lines: (1) Conservation of wool and cotton materials as a war service (this was continued as a thrift measure and included the remodeling and renovating of garments); (2) garment making, including the making of dress forms, alteration of commercial patterns, and the making and fitting of adults' and children's garments; and (3) the establishment of salvage shops for the remodeling and renovating of garments.

The clothing work affords a striking example of the assistance that can be rendered by the local women. In a number of States it is largely due to the effort of the local women that the work has been

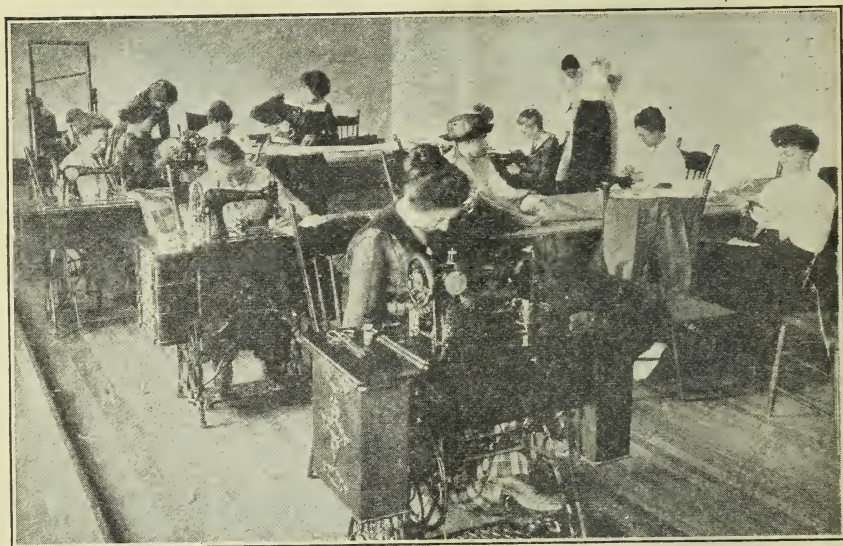


FIG. 7.—Extension work with clothing is helpful and popular. A survey of 10,000 farm homes shows 75 per cent of farm housewives making a generous share of the family clothing. Clothing schools like the one pictured above have proved that the clothing specialist and the home demonstration agent can give the home dressmaker a grasp of the principles of clothing construction and a mastery of professional short cuts that save time, money, and worry.

so generally effective. Massachusetts is a conspicuous example of the growing tendency to use the skill and experience of local women in extending the instruction given by clothing specialists and home demonstration agents. In this State local leaders trained by the specialist and agents have extended practical assistance much further than could have been done by any other method. Lessons in millinery were given in the same way.

This piece of extension work and the results obtained from it have met a long-felt want in rural communities, where the problem of suitable clothing for the housewife and members of her family has been serious for years.

IMPROVING HOME AND COMMUNITY SURROUNDINGS.

This work is in its infancy. Interest in this project began immediately after the close of the war, and some initial efforts on its various phases were started in 1919.

Tree planting developed sufficiently to prove that people everywhere are becoming conscious of the desire for beauty in surroundings. Some phases of the project undertaken included tree planting, especially in arid regions, improvement of public camping grounds, planting of flowers and shrubs, and the improvement of school buildings. In one county, in Colorado, 11 communities placed tree growing on their program of work, and approximately 2,000 trees were ordered through the farm bureau. A New Mexico county adopted rose planting for the beautifying of home grounds as a project.

COMMUNITY ENTERPRISES.

During 1918 the home demonstration agent was often the chief worker in community enterprises, which frequently included campaigns for the preservation and conservation of food and for other emergency purposes, but in 1919 she was principally the organizer and her office a clearing house for ideas regarding the work. Some of the activities which were instituted as wartime measures are now permanent, and have become an economic factor in the community. The home demonstration agent has been instrumental in crystallizing the sentiment of the community into definite plans based on actual needs, and has assisted in organizing the available talent for carrying on these local enterprises.

Three types of community enterprises were developed during the year: (1) Economic, including food preservation, the hot school lunch, cooperative laundries, cooperative buying and selling associations, labor-saving devices, and salvage shops; (2) social, including recreation centers, civic improvements, and rest rooms; and (3) educational, such as farm home tours, libraries, and magazine circles.

Special interest was shown in those community enterprises which represent an awakened social consciousness, as indicated by the establishment of rest rooms, circulating libraries, magazine centers, study tours, public playgrounds, public markets, cooperative laundries. Improving the school lunch was undertaken as a community project in every State. State reports show this work to be progressing so satisfactorily that during 1920 it will be continued by local people, with less need for aid from the home demonstration agent in creating interest in it.

Out of the 462 food preservation and demonstration centers which were established during the war, 195 were in operation last year

and have been reorganized on permanent plans. The volunteer management of the war period has been replaced by a paid manager and assistants and the enterprise has been put on a business basis. Community canning and curing of meat, fish, poultry, and game as well as the canning of vegetables and fruits will be concentrated in these centers in many localities.

Several ventures in establishing curb markets by the local women under the direction of the home demonstration agents were started in 1918, but one general market in California and a poultry market

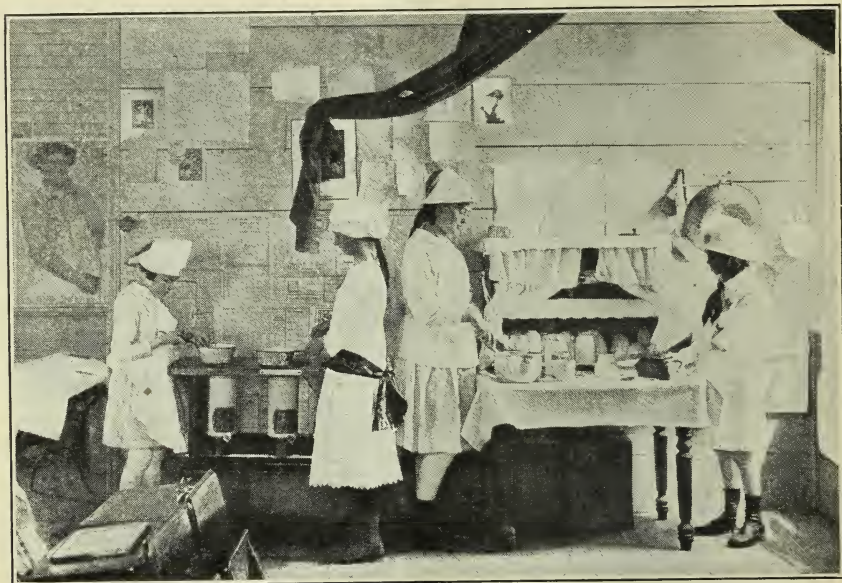


FIG. 8.—Home demonstration agents have been pioneers in introducing the hot school lunch. Records for demonstration groups of rural school children prove that serving a hot dish to supplement the cold lunch brought from home results in increased weight, better spirits, and improved school records. Special emphasis is laid on the use of milk. The work takes little time, the children enjoy it, and the picture shows that the equipment may be very inexpensive.

in Nebraska seem to give the most promising indications of permanency.

Clean-up campaigns aided by home demonstration agents have borne fruit in a general realization that civic improvement is the responsibility of all the people, and landscape gardening for school and church grounds, improvement of school buildings, public toilets, and waiting stations; and the planting of trees, flowers, and shrubs are other civic expressions of the purpose and influence of the community enterprises fostered by the home demonstration agents.

Sixty-eight cooperative buying and selling associations, with a membership of 12,905, and conducting a business valued at \$45,927, were formed during the year 1919; 191 salvage shops were opened

and 58 community rest rooms furnished for the convenience of the local people, and 96 recreation centers were established.

SUMMARY.

Benefits accruing from educational work are difficult to determine, and this is particularly true when the education deals with habits of living and the ordinary practices of daily work. Intangible influence is often much greater than that which can be summarized or tabulated. Owing to the newness of the work and the inexperience of the workers in following up demonstrations, the reports of home demonstration work last year by no means tell the story of achievement.

Some of the leading lines and results of home demonstration work in 1919 are summarized in the following tables:

Projects and their distribution, by States, in 1919.

States.	Home man- age- ment.	House plan- ning.	Food pro- duc- tion.	Food pres- erva- tion.	Nutri- tion.	Health and child care.	Cloth- ing.	Com- munity enter- prises.	Total.
Arizona.....	X		X	X	X	X	X	X	7
California.....	X	X	X	X	X	X	X	X	8
Colorado.....	X	X	X	X	X	X	X	X	7
Connecticut.....	X	X	X	X	X	X	X	X	8
Delaware.....	X				X	X	X	X	5
Idaho.....	X	X	X	X	X	X	X	X	8
Illinois.....	X	X	X	X	X	X	X	X	8
Indiana.....	X	X	X	X	X	X	X	X	8
Iowa.....	X				X	X	X	X	7
Kansas.....	X		X	X	X	X	X	X	7
Maine.....	X			X	X		X	X	5
Massachusetts.....	X			X	X	X	X	X	6
Michigan.....	X		X	X	X	X	X	X	7
Minnesota.....	X		X	X	X	X	X	X	7
Missouri.....	X		X	X	X	X	X	X	7
Montana.....	X		X	X	X	X	X	X	7
Nebraska.....	X			X	X	X	X	X	6
Nevada.....	X	X	X	X	X	X	X	X	8
New Hampshire.....	X		X	X	X	X	X	X	7
New Jersey.....	X			X	X	X	X	X	6
New Mexico.....	X	X	X	X	X		X	X	7
New York.....	X			X	X	X	X	X	6
North Dakota.....	X		X	X	X	X	X	X	7
Ohio.....	X		X	X	X	X	X	X	7
Oregon.....	X			X	X	X	X	X	6
Pennsylvania ¹	X				X		X		3
Rhode Island.....	X				X		X		7
South Dakota.....	X	X	X	X	X	X	X	X	8
Utah.....	X	X	X	X	X	X	X	X	8
Vermont.....	X		X	X	X		X	X	6
Washington.....	X	X		X	X	X	X	X	7
Wisconsin.....	X			X	X	X	X	X	3
Wyoming.....	X		X	X	X		X	X	6
Total.....	31	11	23	30	31	24	32	30	212

¹ No counties with a permanent home demonstration agent.

Some results of extension work with women, 1919.

Kind and extent of work.		Estimated value.
Gardens planted.....	31,460	
Estimated value of produce from gardens.....		\$421,911
Poultry flocks culled.....	3,212	
Nonlaying hens eliminated.....	107,445	
Estimated value of eggs preserved and sold.....		346,396
Local leaders trained in butter and cheese making.....		635
Cottage and other cheeses made.....	pounds.. 395,718	
Estimated value of cheeses.....		69,035
Fruits and vegetables canned.....	quarts.. 1,894,099	
Jellies and jams made.....	do.. 443,621	
Dried fruits and vegetables.....	pounds.. 386,989	
Brined vegetables.....	quarts.. 76,389	
Estimated value of preserved fruits and vegetables.....		873,084
Poultry canned.....	quarts.. 63,989	
Beef canned.....	do.. 55,047	
Pork canned.....	do.. 25,676	
Estimated value of canned meats.....		107,349
Pork, smoked or pickled.....	pounds.. 440,948	
Game and fish preserved.....	do.. 136,618	
Hot lunches established in schools.....		116,136
Number of children reached through hot school lunch.....		40,448
Number of children showing marked improvement as result of hot school lunch.....		
Counties adopting home nursing project.....		5,223
Families receiving instruction in home nursing.....		202
Counties adopting home convenience project.....		31,729
Washing machines purchased.....		166
Fireless cookers purchased.....		659
Driers purchased for home drying.....		3,623
Power machinery purchased for home use, number pieces.....		594
Water systems installed.....		428
Rearranged kitchens.....		473
Garments made or remodeled.....		1,169
Estimated saving in clothing.....		45,592
Families keeping expense records.....		
Families adopting a budget system.....		6,427
Community kitchens established.....		1,260
Cooperative buying and selling associations established.....		225
Membership in cooperative associations.....		68
Estimated value of cooperative business.....		12,905
Salvage shops opened.....		
Community rest rooms opened.....		191
Recreation centers established.....		58
		96

The data given in these tables show the few lines of work that can be tabulated. In securing these results and others not reported, the home demonstration agents visited during the year 74,588 women, while 117,073 people called at the home demonstration agents' offices on matters relating to home demonstration work. Fifty-three thousand eight hundred and twelve meetings and demonstrations were held under the direction of the home demonstration agents, attended by 2,038,779 people, and 2,549 boys' and girls' clubs were organized with a membership of 2,619 boys and 21,333 girls. The home demonstration agents sent out 463,476 letters, not including circulars, wrote 20,369 articles for the use of local leaders, and distributed bulletins and leaflets as follows: Publications of United States Department of Agriculture 966,360, of the State college of agriculture 610,903, issued by other agencies 388,436. The total number of people reached through the activities of the home demonstration agent is reported as 2,132,699.

OUTLOOK.

It is safe to state that the fiscal year just passed marks the real beginning in the Northern and Western States of organized home demonstration work on a broad, permanent basis, conforming to the

idea of community self-determination and leadership. This work, which began with State-wide propaganda of college ideals in home economics and which often disregarded individual and community initiative, has now crystalized into plans made and carried out by home makers themselves who are assisted and guided by home demonstration agents and such specialists as the agricultural college is able to supply. Thus, from the overhead type of organization with the few assuming the responsibility and deriving the benefits, the trend is toward an ideal partnership between the scientific worker and the housewives whom she serves.

Extension workers have as yet but glimpsed the possibilities of home demonstration work as a means of discovering and developing latent leadership and power, and of stimulating in the women of the country the habit of observing and analyzing home and community conditions with a view to taking organized action to change these conditions so that there may be developed a richer and more satisfying country life.

The future is full of promise. Successful work seems more certain in counties where a concentrated program has been followed. There is still a tendency in some sections to continue the form of extension work which calls for a program largely presented by paid workers. There are, however, a sufficient number of States which are following the modern plan of extension work requiring the cooperation and experience of the local women to prove that it is the way to permanence and success. Many of the agents are coming to realize that intensive work on not more than two projects which fit some immediate need of the people has effected more definite results and gained a stronger and more liberal support from the local people than is possible when a larger program is attempted.

On June 30, 1920, there was a considerable increase in the number of counties which had opened their doors to admit women members to the county extension organization and include the home projects in their programs of work. In counties where this was done the results have been gratifying not only in the development of home demonstration work, but in strengthening the extension organization and extending its usefulness.

As one looks back to 1916 and realizes the amount of money and effort that has been expended upon this work the development seems comparatively small, yet to-day, with less than 300 home demonstration agents, 50 per cent of whom have been in the service less than a year, we have probably reached the highest level yet attained in extension work with rural women, and the stability and permanency of this work seem assured because of the support and cooperation of the rural people, based on the conviction that it increases home efficiency and improves rural life.

23

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN

HERD LIST No. 3

LIST OF HERDS, ALL BREEDS, OFFICIALLY ACCREDITED
AS FREE FROM TUBERCULOSIS

TUBERCULOSIS ERADICATION DIVISION
J. A. KIERNAN, Chief



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 142

Contribution from the Bureau of Animal Industry
JOHN R. MOHLER, Chief

Washington, D. C.

Revised to June 30, 1920

CONTROL with a view to the eventual eradication of tuberculosis in cattle is being accomplished by systematic efforts of Federal and State authorities in cooperation with cattle breeders' associations and herd owners.

A definite plan was adopted in 1917 whereby herds of cattle passing the prescribed number of official tuberculin tests should be certified or accredited as free from tuberculosis.

An accredited herd is one that has successfully passed two annual or three semiannual tuberculin tests applied by regularly employed veterinary inspectors of the Bureau of Animal Industry or of the State where cooperative work is conducted, and has otherwise complied with the regulations governing the work.

The following list shows herds accredited to date. If the status of any of the accredited herds on this list is changed, prompt notice of the fact will be furnished to the officials of the various States.

The different breeds of cattle, the names of the owners, and States where the herds are located are arranged in alphabetical order. A number of summary lists are also included. Additional lists will be published from time to time.

For information on herds which have been tested once and found to be free from tuberculosis, apply to the Bureau of Animal Industry, United States Department of Agriculture, stating the breed or breeds in which you are interested.

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN.

HERD LIST NO. 3.

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Devon.....	7
Dutch Belted.....	7
Galloway.....	7
Guernsey.....	7
Hereford.....	14
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Holstein-Friesian.....	17
Jersey.....	29
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In the following lists the herds under the heading "Accredited" are those accredited by the State officials and the United States Department of Agriculture as free from tuberculosis. Those in the tables under the heading "Once tested without reactors" have passed successfully one official tuberculin test. This publication contains the names and addresses of owners of accredited herds of 5 or more purebred cattle or 10 or more grades. A tabulation of the smaller herds appears on page 47. For supplementary lists of once-tested herds, apply to the Bureau of Animal Industry, Washington, D. C.

A large number of other herds have been tested officially, but as one or more reacting or suspected animals were found in each of them, such herds do not appear except as tabulated on page 49.

1. LIST OF ACCREDITED HERDS OF NOT LESS THAN 5 PUREBRED OR 10 GRADE CATTLE, SHOWING OWNERS, BREEDS, AND STATES WHERE LOCATED.

ABERDEEN ANGUS.

Name.	Address.	Purebred cattle.	Grade cattle.
ALABAMA.			
French, H. L.	Athens.	13	10
Raney Bros.	Marion Junction.	31	1
ARKANSAS.			
Dalton, E.	Pocahontas.	38	
Mebane Bros.	Piggott.	19	3
Mebane & Son, W. W.	do.	17	1
INDIANA.			
Hewitt, Raymond.	West Terre Haute.	7	5
Leaming, G. C.	Romney.	18	2
Peebles, A. D.	Darlington.	11	2
Pruesner, Wm. F.	Oaktown.	11	9
Purdue University.	La Fayette.	108	7
Shonkwiler, Elmer.	Raub.	8	3
KANSAS.			
Hedstrom, Emil.	Lost Springs.	44	
KENTUCKY.			
Cave, J. T.	Bardwell.	9	
Holeman, W. A.	Cunningham.	31	
Mattingly, Con & Gus.	Hardinsburg.	8	7
Moseby, Dr. Wm. L.	Bardwell.	29	6
Parkhurst, G. A.	Smithfield.	29	15
MASSACHUSETTS.			
Watson, John B.	Becket, R. R.	16	
MINNESOTA.			
Anderson, W. J.	Winnebago, R. 3.	27	2
Campbell Bros.	Utica.	52	25
Campbell, Wallace.	do.	42	2
Cocker, N. R. & W. J.	Lanesboro.	16	8
Emmons, H. H.	Emmons.	30	5
Keeler, R. W.	Chokio.	39	6
McCarville, D. F.	Slayton.	21	3
Messer, B. P., & Son.	Huntley.	11	13
Meyer, Wm.	Blue Earth.	14	8
Milne, John.	Canton.	22	4
Olson, J. O.	Nelson.	29	2
Peters, C. A.	Freeborn.	4	40
Purvis, Geo. E.	Eyota.	40	
Riddell, G. H.	Balaton.	11	8
Roberts, D. R.	Russell.	12	5
Ryan, C. A.	Canton.	19	3
Thompson, G. C.	Fairmont.	19	6
Thorsen, Olaf.	Peterson, R. 2.	44	8
Willford, M. C.	Canton.	15	5
MISSISSIPPI.			
Dunn, T. F.	Hazlehurst.	27	
Magnolia Stock Farm.	Sardis.	190	
NEBRASKA.			
Amsberry, J. A.	Mason City.	90	
Dorset, Mrs. N. A.	do.	11	1
Duke, Mrs. Z. A.	do.	9	
Hoyder, Albert L.	Fairfield.	6	9
Webermeier, W. J.	Milford.	16	2
NORTH CAROLINA.			
Pilot Stock Farm.	Salisbury.	51	14
Tyson, Grigg T.	Greenville.		16
NORTH DAKOTA.			
Boyd, D. C.	Crary.	18	6
Johnson, John E.	Danzig.	16	
Larson, L. A.	Pingree.	30	4
Stauffer, J. G. L.	Steele.	26	3
Wylder, Louis.	Cathay.	33	

ABERDEEN ANGUS—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
OHIO.			
Gossett, E. L.....	Mount Crab.....	2	5
Griffith, J. F.....	Everett.....	15	.....
Hutchison, E. H.....	Xenia.....	19	5
Jones & Son, J. W.....	Larue.....	54	9
PENNSYLVANIA.			
Osborne, D. A., & Sons.....	Jackson Center, R. 18.....	15	10
Woods, F. A., & Sons.....	Mercer, R. 8.....	18	6
SOUTH CAROLINA.			
Arrington Bros.....	Kirksey.....	5	37
Stalworth, J. L.....	Gaines.....	.....	32
SOUTH DAKOTA.			
Speirs, John R.....	Ree Heights.....	58	8
TENNESSEE.			
Ames Plantation.....	Grand Junction.....	103	63
Anderson, S. B.....	Cookeville.....	4	5
Bogle & Bogle.....	Lenoir City.....	16	3
Brakebill, H. W. & C. S.....	Rockford.....	23	.....
Duncan, Henry.....	Maryville.....	53	18
Frow, J. M.....	do.....	58	4
Hardin, G. B.....	Concord.....	9	6
Hitch, John.....	Maryville.....	81	31
Kinnard, J. T.....	Columbia.....	16	8
Moore, Robt. W.....	Bolivar.....	12	1
Thompson, M. H.....	Norene.....	14	13
Whitehurst, Dr. F. W.....	Brownsville.....	4	1
VIRGINIA.			
Buchanan, A. F.....	Glade Spring.....	22	.....
Garrett, S. H.....	Locust Dale.....	14	4
McSpadden, J. E.....	Chilhowie.....	11	37
Morrison, G. H.....	Fredericksburg.....	5	21
Total (Aberdeen Angus, United States).....		2, 068	588

AYRSHIRE.

FLORIDA.			
Barthold, J. Frank.....	Jacksonville, Lackawanna Road.....	3	33
INDIANA.			
Richards, C. C.....	Oaklandon.....	51	.....
KANSAS.			
Gossard Breeding Estates.....	Turon.....	66	.....
Sanderson, A. H.....	Marysville.....	3	9
Schoenleber, F. S.....	Linwood.....	35	1
Taylor, George.....	Onaga.....	13	7
Wendell, Thos.....	Beattie.....	5	2
Wilson, Alta M.....	Olathe.....	7	34
MAINE.			
Atwood, Jordan F.....	Sabattus, R. I.....	11	.....
Bragan, Clinton J.....	Hallowell.....	5	11
Bryant, W. L.....	East Summer.....	9	.....
Dean, Alvin F.....	Portland.....	23	.....
Dunn, A. L.....	North Yarmouth.....	6	.....
Files, Dr. E. W.....	Portland.....	54	.....
Lunt, James L.....	Mechanics Falls.....	11	.....
Robinson, A. H.....	Bangor.....	.....	10
MARYLAND.			
Gorsuch, Dickinson.....	Glencoe.....	14	.....
MASSACHUSETTS.			
Hinckley, H. P.....	Agawam.....	52	.....

AYRSHIRE—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA.			
Chambers Bros.....	Havana.....	18	.....
Gallinger, R. J.....	Glenwood.....	21	.....
Wessel Bros.....	Winona.....	2	22
Wilcox, Mrs. J. F.....	Excelsior.....	6	.....
MISSISSIPPI.			
Mississippi Agricultural and Mechanical College.	Starkville.....	23	14
NEW JERSEY.			
Barrett, Frank B.....	Red Bank.....	15	.....
Probasco, Wm. V.....	Creamridge.....	24	.....
NEW YORK.			
Goodyear, C. W.....	Youngstown.....	6	.....
Sherman, Frank R.....	Schuylerville.....	24	.....
Smiley, Daniel.....	Mohonk Lake.....	.....	22
Stanton, Frank.....	Greenville.....	13	3
Stowell, Floyd D.....	Black Creek.....	71	.....
OREGON.			
Honeyman, J. D.....	Scappoose.....	61	.....
PENNSYLVANIA.			
Deubler's, James, Sons.....	Berwyn, Valley Forge Farms.....	96	2
Griscom, Mrs. C. A.....	Gladwyne, Soapstone Farm.....	28	1
Mowrey, Guy A.....	Danville, R. 5.....	11	.....
Palmer, Charles A.....	Montrose, R. 6.....	24	3
Pennsylvania State College	State College.....	8	1
Roberts, Percival, jr.....	Narberth, Penshurst Farm.....	144	.....
Stony Ridge Farm; Geo. H. Rohrer, manager.	Bowers.....	6	3
Williamson Free Trade School.....	Williamson School.....	24	.....
RHODE ISLAND.			
Perry, Harvey.....	Westerly.....	8	.....
VERMONT.			
Bell, E. H.....	St. Albans.....	9	10
Dewey, J. E.....	Middlebury.....	11	.....
Dunham, C. E.....	Bethel.....	14	3
Lanson, N. G.....	South Royalton.....	9	.....
Richards, E. K.....	Kirby.....	.....	18
Sheldon, Rex P.....	Salisbury.....	12	9
United States Government Morgan Horse Farm.	Middlebury.....	4	.....
VIRGINIA.			
Mann, H. W.....	Cobham.....	.....	56
WASHINGTON.			
Chandler, E. M.....	Burbank.....	7	.....
WEST VIRGINIA.			
Reymann, Paul O., Hill Top Farm.....	Wheeling.....	109	.....
West Virginia Agricultural Experiment Station, Reymann Memorial Farm.	Wardensville.....	91	.....
WISCONSIN.			
Laubenstein, Val & Son.....	Grafton.....	20	.....
Total (Ayrshire, United States).....		1,287	274

BROWN SWISS.

ALABAMA.			
Streit, R. J.....	Leighton.....	.....	33
ILLINOIS.			
Peterson, P. A.....	Newark.....	10	.....
INDIANA.			
Yoder, M. S.....	Shipshewana.....	11	.....

BROWN SWISS—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA.			
Bergler, Wm.....	Winona.....		22
Dale, J. W.....	Dawson.....	16	
Lilly, A.....	La Crescent.....	41	5
MONTANA.			
Bohart, W. O.....	Bozeman.....	60	
NEW YORK.			
Freemver, Frank.....	Middleburg.....	83	
OREGON.			
Brugger, Theo.....	Gresham.....	26	
Inman, B. P.....	Junction City.....	18	2
Meyersick, Ed.....	La Grande.....	9	
WEST VIRGINIA.			
Neuhard, Geo. H.....	Elm Grove, R.....	23	
WISCONSIN.			
Inman, Ira.....	Beloit.....	38	
Martin, Andrew.....	West Salem.....	52	1
Total (Brown Swiss, United States).....		387	63

DEVON.

NEW HAMPSHIRE.			
Carr, H. D.....	Lebanon.....	6	
SOUTH CAROLINA.			
Palmer, E. G.....	Ridgeway.....	28	6
Total (Devon, United States).....		34	6

DUTCH BELTED.

MAINE.			
Wilson, J. A.....	Brunswick.....	18	
Total (Dutch Belted, United States).....		18	

GALLOWAY.

MINNESOTA.			
Van Valkenburgh, H. W.....	Osakis.....	38	40
Total (Galloway, United States).....		38	40

GUERNSEY.

CONNECTICUT.			
Converse, E. C.....	Greenwich.....	56	32
DELAWARE.			
Breidablik Farms.....	Wilmington.....	64	57
Delcastle Farms.....	do.....	45	35
DISTRICT OF COLUMBIA.			
National Training School for Girls.....	Conduit Road and District Line.....	1	9
FLORIDA.			
Johnson, V. C.....	Dinsmore.....	6	156

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
ILLINOIS.			
Babson, Fred. K.	Hinsdale.	82	
Donnelley, Reuben H.	Libertyville.	41	
Lehman, O. W.	Lake Villa.	69	
Quinn, Frank J.	Peoria.	23	
Saemisch, R. G.	Long Point.	3	11
Sass, Ernest W.	Streator.	68	3
Ten Broeck, Drew.	McLean.	49	
Welch, Geo. W.	Colchester.	6	
Ziesing, August.	Deerfield.	41	
INDIANA.			
Adams, A. F.	Plymouth.	19	
Eberhart, F. J.	Mishawaka.	23	20
George, C. R. & R. L.	Lebanon.	5	2
Halt, Demis A., Estate.	Plymouth.	7	
Harness, Harry E.	Andrews.	7	
Johnson, Mrs. M. C.	Muncie.	19	1
McNagney, Robt. R.	Columbia City.	27	21
McQuinn, J. S. & E. G.	Newcastle.	27	8
Rauth & Sons, J. Geo.	Booneville.	6	14
IOWA.			
Adams & Swain.	Algona.		48
Forsythe, Piercy.	Grissold.	8	8
Hutchins, H. D.	Algona.		14
Mountain Bros.	Des Moines, R. 5.	55	
Wimer, H. E.	Blencoe.	13	29
KANSAS.			
Ransom & Devilbiss.	Homewood.	51	13
MAINE.			
Ames, Mrs. J. B.	Castine.	4	13
Ayer, W. R. & Sons.	Augusta.	23	11
Brown, Herbert J.	Portland.	11	
Copeland, Roswell E.	Brewer.		28
Copeland, Will H.	do.		10
Day Bros.	West Kennebunk.	2	15
Day, Frank B.	Lisbon Falls.	3	18
Drummond, A. T.	Waterville.	17	2
Dunning, Jas. A.	Bangor.	7	
Earl, Elmer J.	Danforth.	4	7
Farwell, Arthur L.	Cumberland Center.		10
Goding, L. S.	Monmouth.	14	
Hampson, J. A.	West Falmouth.	8	6
Hilton, H. J.	St. Albans.	13	
Spaulding, F. L.	Augusta.	14	
MARYLAND.			
Bacchus, T. W.	Elkton.	28	
Beacham, Jas. W.	Westminster.	1	36
Beal, A. W.	Forestville.	1	18
Bester, H. E.	Hagerstown.	7	6
Dorsey, Wilbur.	Annapolis Junction.	18	26
Downey, Geo.	Sharpsburg, R. 1.	2	13
Downey, Simon.	Williamsport.	1	6
Fenwick, C. Bernard.	Glyndon.	7	
Forwood, Jas. W.	Street.		11
Grosvenor, G. H.	Bethesda.		11
Gude, H. J.	Hyattsville.		11
Harkins, E. H.	Forest Hill.		24
Jenkins, Harry S.	Riderwood.	9	
Loar, C. W.	Frostburg.		34
Merryman, Louis McL.	Cokeysville.	71	
Michael, C. O.	Bel Air.		13
Schroek, Alvin.	Grantsville.		25
Warfield, Henry M., jr.	Timonium.	7	5
Wheeler, Barnett.	Bel Air.	2	16
Young, J. Forney.	Hagerstown.	13	26
MASSACHUSETTS.			
Blagden, Samuel.	Williamstown.	4	29
Chett, G. A.	do.	31	
Cutter, Miss Edna.	Praut.	5	10
Eaton, A. W.	Pittsfield.	8	6
Everett, H. C.	Barnstable.	27	
Harrington, Mrs. Josephine.	Ipswich.	5	

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MASSACHUSETTS—continued.			
McBurney, Henry	Stockbridge	34	
May, E. P.	Framingham	11	
Silsbee, Miss Katherine E	Beverly	7	
Stokes, Anson Phelps	Lenox	31	9
Turgeon, F. N.	East Brookfield	10	2
Wheeler, Frank T.	Great Barrington	22	
MICHIGAN.			
Ballard Bros.	Niles	33	
Edmands, Miss Hattie K.	Three Rivers	10	
Gilmore Bros.	Camden	16	6
Hemmingway, Earl	Sodus	12	
Morlock, August	Watervliet	15	1
Oliver, William H.	Grand Rapids	22	
Palmer, Dr. R. J.	Wayne	49	8
Parnall, Dr. C. G.	Jackson	41	8
Smith, A. M.	Lake City	22	
Umholtz, Wm. H.	Niles	19	
MINNESOTA.			
Adams, W. R.	Mankato	30	2
Aldrich, Charles	Buffalo	4	15
Anderson, A. E.	Thief River Falls	1	12
Anderson, P. J. & R. W.	Lindstrom	7	24
Arnbal, Jens.	Albert Lea	30	
Bell & Prentiss, Briarcombe Farm	Winona	16	43
Bergler, John	do.		23
Beutel, J. E.	Lake Elmo	5	16
Bragg, A. W.	Albert Lea, R. 1.	13	3
Case, F. H.	Good Thunder	3	13
Conklin, F. B.	Thief River Falls	12	4
Degnau, Patrick	Pine River	2	11
Eberhardt Bros.	Albert Lea	16	25
Ehlers, A. H.	Farmington	13	12
Engelstad, Pete	Thief River Falls	3	80
Engelstad, Paul	do.		13
Esse, Ole	Hayward	1	30
French, A. L.	Anoka	19	3
Frissell, E. R.	Hopkins	35	4
Fulsang, Andrew	Glencoe		17
Fulsang, Henry	do.		14
Gilland, W. D.	Morgan	16	4
Gilman, Geo. B.	Garden City	17	3
Hanson, H. P., Maple Lawn Farm	Albert Lea	6	20
Hartley, G. G.	Duluth	60	
Hovland Bros.	Emmons	6	21
Johnson, Albert	Thief River Falls	3	14
Karnuth, E.	Lake Elmo	1	25
Koop, Henry	St. Hilaire		19
Lee Farm; Nate Whitney, manager	Albert Lea	7	33
Lemke, W. A.	do.	5	24
Lilienthal, John	Glencoe		38
Lohman, C. A.	Lake Elmo	7	16
Loring, A. L., Woodend Farm	Mound	40	
Lueck, Theo.	Glencoe	4	20
McGrew, E. E.	Dassel	74	2
McFarlane, R. B.	Alexandria	9	21
McLeod, Stuart	Goodridge	6	20
Mitchell, Arthur	Mankato	15	17
Nahrgang, J. H.	Lewiston	27	16
Nelson, Charles	Hayward	1	23
Nelson, John P., Farig Falls Farm	Stillwater	19	5
Nesler, R. C.	St. Charles		19
Norman, T. C.	Lake Crystal	14	
Olson & Krans.	Dassel	22	15
Olson, G. W.	Carver	4	26
Ott Bros.	Albert Lea	16	30
Peterson, Oscar	Swanburg		10
Peterson, P. J.	do.	1	18
Poszanz, Jos.	Winona		13
Richardson, Geo. E.	Garden City	20	1
Ruble, C. H., & Son	Albert Lea	3	22
Ruble, John D.	do.	5	37
Rund, Harry	Swanburg		10
Schmitt, J. W., George Washington Farms	Mankato	22	12
Sherwood, N. D.	Pine River	2	4
Skaar, Chris	Hayward	21	4
Skaar, M. S. & C. A.	do.	24	16
Skaar, P. J.	Albert Lea	3	14

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA—continued.			
Staff, George.....	Farmington.....	3	13
Stiehl Victor.....	Albert Lea, R. 5.....	19	12
Stradman, Fred.....	Glencoe.....	5	24
Sweet, W. R.....	Albert Lea.....	8	2
Univ. of Minn.....	Duluth.....	8	25
Walters, Mrs. Sophie.....	Thief River Falls.....	10	10
Walton, Lewis.....	Pine River.....	10	10
Wirt, Charles.....	Lewiston.....	42	.....
Woolson, Harry C.....	Thief River Falls.....	17	.....
Zirk, M. F.....	South Haven.....	3	15
MONTANA.			
Bohart, W. O.....	Bozeman.....	18	.....
Glodt, Louis.....	Park City.....	.....	18
NEW HAMPSHIRE.			
Clark, Mrs. H. M.....	Orford.....	25	.....
New Hampshire College of Agriculture.....	Durham.....	49	7
NEW JERSEY.			
Borden, Herbert T.....	Mickleton.....	41	.....
Cleveland, Charles D.....	Eatontown.....	35	.....
Gill, E. T.....	Haddonfield.....	65	47
Hensler, Arthur C.....	Morris Plains.....	21	.....
Johnson, R. W.....	New Brunswick.....	5	.....
Jones, Levi S.....	Swedesboro.....	.....	12
Leeds, Henry W.....	Westville.....	40	.....
Lindabury, R. V.....	Bernardsville.....	54	.....
New Jersey State Home for Boys.....	Jamesburg.....	.....	65
Wilson, M. A.....	Skillman.....	2	17
NEW YORK.			
Barlow, R. E. & F. S.....	Amsterdam.....	30	.....
Breuchand, Jules.....	Olivebridge.....	23	.....
Clark, Eugene H.....	Westmoreland.....	19	.....
Danks, J. Russell.....	Delancey.....	19	.....
Elderkin, Eugene M.....	Springville.....	11	15
Etzel, G. F. & A. C.....	Highland Mills.....	5	.....
Hammond, John H.....	Mount Kisco.....	25	1
Hopkins, George G., jr.....	Ballston Lake.....	6	6
McElroy, J. R.....	Jonesville.....	6	.....
McEwan, C. B.....	Loudonville.....	5	.....
Moore, C. C.....	Unadilla.....	19	.....
Morton, W. J.....	Springville.....	39	.....
Ogden, A. T.....	Kinderhook.....	28	.....
Sage, Henry M.....	Albany.....	31	.....
Smiley, Daniel.....	Mohonk Lake.....	5	119
Southard, Floyd.....	Ira.....	23	2
Stone, G. C.....	Pawling.....	38	.....
Taylor, Moses.....	Mount Kisco.....	30	.....
Tilford, H. M.....	Tuxedo Park.....	32	8
Van Alstyne, J. E.....	Kinderhook.....	36	8
Whitney, C. L. A.....	Albany.....	31	.....
Winston, J. O.....	Saugerties.....	40	.....
NORTH CAROLINA.			
Barnhardt, H. J.....	China Grove.....	2	5
Ceall, J. L.....	Linwood.....	23	.....
Fathey, W. E.....	Fletcher, R. 1.....	.....	11
Fisher, C. M.....	Rockwell, R. 1.....	1	11
Graham, W. D.....	Mount Ula.....	5	9
Grymes, J. Byron.....	Raleigh.....	.....	25
Hartman, W. D.....	Salisbury.....	1	6
Hauser, Jas. W.....	Clemmons.....	11	14
Holt, E. J., & Bro.....	Greensboro, R. 2.....	2	22
Hudson, H. S.....	Greensboro.....	.....	31
Lindley, D. W.....	Guilford College.....	.....	13
Neel, C. L.....	Salisbury.....	19	5
Osborne, H. A.....	Canton.....	25	39
Shouse, D. J.....	Bethonia.....	.....	12
Wellman & Morgan.....	Winston-Salem.....	2	15
Williams, G. F.....	Greensboro.....	1	18
Wilson, G. G.....	Asheville, R. 3.....	.....	18
NORTH DAKOTA.			
Agricultural College.....	Agricultural College.....	9	.....
Clara Cooper Farm.....	Courtenay.....	12	2
Lee, Nels R.....	Grafton.....	1	21
Monck, B. B.....	Minot.....	18	.....
Person, E. S.....	do.....	26	.....

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
OHIO.			
Berkebile, Sam & Ray	Delta	5	9
Black, F. B.	Mansfield	32	5
Butler, W. H.	Sandusky	4	9
Erl, William	Bellevue	21	1
Meyer, Clarence & Lydia	Monroeville	2	8
Miller & Son, E. H.	Clyde	10	3
White, Windsor T.	Chagrin Falls	23	
OREGON.			
Goodwin, W. A.	Cornelius	29	
Hughes, A. I. & J.	Oregon City	14	
Reith, W. O.	Astoria	18	
Richey, J. A. & J. T.	Boring	15	
Ringo, Clyde	Mulino	8	
PENNSYLVANIA.			
Bender, C. W.	Elk Lick	1	14
Bender, Norman E.	do.		12
Billig, R. M.	Diamond, R. 2	1	12
Braham, W. W.	Grove City, R. 16	5	10
Buchanan, James M.	Grove City, R. 13	5	3
Christianson, A.	Butler, R. 6	7	1
Cooper, A. L.	Slippery Rock, R. 3	5	10
Cummings, J. H.	Wernersville, Belle Alto Farm	36	22
Dickey, George	Slippery Rock, R. 4	6	15
Edeburn, H. B.	Mercer, R. 1	5	5
Finney, R. C.	Mercer, R. 2, Merrydale Farm	10	
Forster, W. H.	Erie, Etherston Farm	15	
Fretz, W. F.	Pipersville, Fritzlyn Farm	45	
Gill, L. C.	Titusville, R. 5	2	11
Grute, J. W.	Cochran, R. 3	6	8
Hancox, F. N.	Titusville, Chestnut Ridge Farm	5	16
Hollingsworth, M. M.	Landenberg, Wasteland Farm	40	
King, W. M.	Mercer, R. 3	2	10
Kunz, J. D. F.	Titusville, R. 5, Audubon Farm	5	6
Lees, D. C.	Mercer, R. 3, Oak Hill Stock Farm	2	11
McCoy, A. C.	Slippery Rock, R. 5, Clover Dell Farm	5	11
McCullough, A. S.	Sharpsville, R. 55	14	
Pearson, Albert	Grove City, R. 16	4	12
Pennsylvania State College	State College	15	3
Root, S. N.	Landisville	47	
Roberts, T. W. & I. W.	Bala, Pencoyd Farms	48	2
Shook Brothers	Spring Mills, Woodlawn Stock Farm No. 2	19	
Shook, J. G.	Spring Mills, Woodlawn Farm No. 1	19	
Shriver, J. M.	Diamond, Homestead Farm	9	12
Smith, Philip W.	New Hope, R. 1, Evergreen Farm	2	12
Vandivort, W. W.	Evans City, R. 1	14	
Waldron, F. A.	Grove City, R. 17, Water Lily Farm	6	7
Weber, J. J. & J. F.	Mercer, R. 1	22	1
Widing, Otto	Mercer, R. 7	5	7
Woodman, S. Paul	Rushland, Stony Batter Farm	6	9
RHODE ISLAND.			
Comins & Lilliebridge	East Greenwich	2	8
Haffenreffer, R. F., jr.	Bristol	29	1
James, Arthur Curtis	Newport	25	
SOUTH CAROLINA.			
Cooper, R. M., jr.	Wisacky	36	1
McCall, C. S.	Bennettsville	15	3
McCutcheon, E. B.	Bishopville	32	5
McIntosh, J. L.	Dovesville	46	
TENNESSEE.			
Murphy, J. R.	Fountain City	9	8
Smith, A. I.	do.	5	51
UTAH.			
Felt, John	Ogden	15	
VERMONT.			
Allen, Ray	South Hero	8	17
Bates, Irving W.	Barre	54	
Brigham, J. M.	Newport	5	22
Brock, James A.	South Newbury		25
Chamberlin, A.; F. C. Lane, manager	Grand Isle		16

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
VERMONT—continued.			
Dowe, Horace N.....	Middlebury.....	13	18
Fisher, Charles.....	Vergennes.....	2	20
Hubbard Bros.....	Swanton.....	4	32
Joslyn, C. F.....	Sharon.....	4	30
Miller, I. G.....	Putney.....	10	6
Waterman, William.....	Tunbridge.....		28
White, J. K.....	Groton.....	28	
VIRGINIA.			
Albrecht, Edward.....	Ashburn.....		21
Arehart, C. L.....	Timberville.....		27
Arundel & Houser.....	Ashburn.....		44
Birdsall, D. H.....	Purcellville.....		29
Blake, Ronald.....	Fairfax.....	7	20
Blue, C. E.....	Charlottesville.....		16
Bowman, D. E. & H. E.....	Waynesboro.....	6	8
Carson, C. E., & Bro.....	Appomattox.....		24
Chamberlain, Leroy.....	Paconian Springs.....	16	3
Chichester, R. H. L.....	Fredericksburg.....	25	
Cole, W. S.....	Purcellville.....	3	20
Conner, J. W.....	Ashburn.....	2	20
Corbin, J. M.....	Hamilton.....	4	26
Courter, J. C.....	Jettersville.....	19	18
Davis, Westmoreland.....	Leesburg.....	84	
Dodson, E. R.....	Ringgold.....		15
Dowden, L. R.....	Calverton.....		30
Driver Bros.....	Waynesboro.....	4	29
Driver, Fred.....	do.....	12	16
Ellmore, S. H.....	Purcellville.....		23
Eustace, W. H.....	Calverton.....		18
Flatten, J. W.....	Norge.....		13
Fraser, J. A.....	Lovington.....	7	4
Garnett, R. G.....	Cumberland.....	1	20
Gould, W. H.....	Burkeville.....	23	15
Haight, G. A.....	Herndon.....	3	27
Hixon, C. T.....	Lincoln.....		16
Hoge, L. Clark.....	Purcellville.....	24	26
Howard, A. F.....	Farmville.....	4	20
Howard, R. Roy.....	Simeon.....		21
Hunt, F. B.....	Clifton.....	14	
Innman, Miss W. L.....	Leesburg.....		18
Irvine, F. I.....	Culpeper.....	2	28
Jackson, J. N.....	Staunton.....	4	22
McCray, R. J.....	Paconian Springs.....	2	12
McNair, W. M., & Son.....	Herndon.....	1	23
Miller, R. J.....	Oakton.....	5	46
Moatz, D. L.....	Round Hill.....	1	26
Murphy, W. B.....	Charlottesville.....		11
Nichols & Seaton.....	Purcellville.....	4	22
Paul, F. D.....	Leesburg.....		39
Payne, M. K.....	Remington.....		11
Payne, R. W.....	Drakes Branch.....	1	12
Peacock, N. A.....	Purcellville.....	6	11
Peyton, W. T.....	Fredericksburg.....	19	19
Pobst, J. W.....	Fairfax.....	2	11
Reynolds, R. J.....	Staunton.....	5	25
Rowe, M. B.....	Fredericksburg.....	19	9
Ryan, Thos. F.....	Oak Ridge.....		18
Salisbury, C. T.....	Fairfax.....	24	
Sands, D. C.....	Middleburg.....	6	64
Scott, A. R.....	Richmond.....	14	9
Smith, Wm. T.....	Lincoln.....	38	47
Tiffany, L. A.....	do.....		12
Tiffany, H. R.....	do.....		14
Virginia Hot Springs Co.....	Hot Springs.....	1	92
Wallace, G. M.....	Falmouth.....		30
Welch, A. W.....	Lincoln.....		14
Welch, F. G.....	Purcellville.....	1	27
Wooding, E. S.....	Sutherland.....	1	13
Yoder, Harney.....	Denbigh.....	2	15
WASHINGTON.			
Gile, A. L.....	Chinook.....	69	
WEST VIRGINIA.			
Bethany College.....	Bethany.....	4	44
Nichols, J. E.....	Elm Grove.....	22	1
Oglebay, E. W.....	Wheeling.....	25	

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
WISCONSIN.			
Allen, W. H.	Medford	7	1
Anderson, Hans	Withee	17	
Bandli, Henry	Rice Lake	17	6
Bartlett, Wm.	Barron	10	9
Bean, A. P.	Vesper	26	7
Beck, Carl, & Sons	Owen	6	14
Bestul, J. M.	Scandinavia	4	15
Bestul, O. L.	do	9	14
Breitrick, F. D., & Sons	Hortonville	13	18
Breitrick, O. H.	Appleton	5	17
Breitrick, W. L.	Greenville	30	
Brown, Cassim	Augusta	8	4
Brunner, Matt	Durand	11	24
Bundy, C. T.	Eau Claire	33	
Burton, Roy	Eagle	21	
Capener, Clifford C.	Baraboo	20	
Coleman, Dr. H. M.	Barron	11	5
Cramer, John, jr.	Menomonie	26	23
Duecker, Herman J.	Kiel	26	7
Earle, Howard E.	Burlington		34
Fisher, Wm. E.	Wauwatosa	15	
French, S. C.	Galesville	20	17
Fries, C. J.	Ogdensburg	3	16
Gerold, H. C.	Weyauwega		28
Gibson, Robert	Durand	7	17
Gordon, L. E., jr., Farm No. 2	Nelsonville		17
Guse, Chas.	Augusta	9	14
Halvorson, Albert	Rice Lake	27	
Halvorson, John	do	11	
Halvorson, Wm.	do	18	10
Heldstab, C. O.	do	4	13
Henderson, F. W.	Whitewater	7	20
Hoard, A. R.	Fort Atkinson	80	
Holtebeck, Andrew	Scandinavia		12
Horton, Edgar L.	Augusta	17	
Huebner, Orvil	Brillion	1	34
Hull, C. L.	Whitewater	2	22
Imholt, B. A.	Stillwater, Minn.	6	18
Johnson, Glenn	Baraboo	6	11
Jones, E. T.	Barron	13	8
Jorgens, C. L.	Scandinavia		15
Jorgens, H. A.	do		15
Jorgens, Orin O.	do		18
Kellogg, Marcus L.	Janesville	14	7
Kjendalen, P. O.	Scandinavia	5	9
Knutson, K. B.	do	4	21
Kolb, Carl	Barron	1	12
Kolb, W. F.	Berlin	11	25
Krings, Peter	Arkansas	14	12
Lawson, Victor	Green Lake, Lone Tree Farm	60	
Lee, M. D.	Hillsboro	22	
Leppen, E. L.	Nelsonville	21	6
Lewis, A. R.	West Salem	19	
Lohrenz, Raymond W.	Hortonville	11	6
Longley, H. N.	Dousman	26	
Lovejoy, Geo. H.	West Salem	7	21
McGrath, Lewis	Chilton	20	
McKerrow, Geo., & Sons Co	Pewaukee, Farm No. 1	33	
Do	Pewaukee, Farm No. 2	25	
Matthys, Albert	Barron	10	6
Matthys, Walter N.	do	13	4
Mayer, Jos.	Chilton	6	16
Meyer, F. W.	Barron	40	1
Michels, John	Peebles	7	6
Michels, Math., & Son	do	38	
Milner, W. H.	Baraboo	8	9
Mulry, W. D.	Sechlersville	20	12
Munsch, E. F.	Weyauwega		20
Murat, L. S.	Scandinavia	22	
Nesbit, Lloyd	Barron	8	1
Noonan, F.	Mauston	9	14
Olson, Martin	Scandinavia		23
Orn, C. J.	Barron	15	
Otis, F. D.	do	10	7
Parish, Alvin	Whitewater	19	19
Peterson, A. A., & Son	Nelsonville	8	10
Powers Bros.	Owen	20	12
Rasmussen, Carl	Ogdensburg		18
Rasmussen, N. A.	Oshkosh	11	7
Ridge, Henry	Whitewater	30	11
Rowe, L. M.	Ogdensburg	15	1
Rundell, Lloyd	Roberts	75	

GUERNSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
WISCONSIN—continued.			
Rundell & Nicholson	Livingston	51	1
Rundell, Wilbur	do.	34	1
Russell, A. C.	Augusta	5	12
Sankey, Geo. W.	Durand	25	
Schmidt, Geo. W.	Stanley		25
Schultz, E. C.	Chilton	7	15
Scott, L. E. & W. H.	Stanley	10	27
Scott, Perry S.	Cameron		12
Sherbert, Edwin	Weyauwega	11	3
Simonson, M. E.	Whitewater	14	11
Slayton, C. H.	Oshkosh	14	27
Spink, L. O.	Platteville	6	26
Stallman, John F.	Elk Mound	21	2
Stevens, L. B.	Hartland	17	
Stout, Mrs. F. D.	Angus	41	
Stout, Henry L.	Mikana	2	34
Swan, Dave	Wauwatosa	2	12
Swan, Frank E.	do.	33	
Tennie, O.	Greenville		15
Thompson, A. H.	Black River Falls	9	22
Tristram Farms Co.	Eau Claire	32	22
Vesely, Geo.	Athens		19
Vogt, E. C., Farm No. 2	Unity		24
Welland, Peter	Hortonville		25
Wellp Bros.	Rice Lake	21	30
Wheeler, Max	Hillsboro	4	19
Wichern, C. W.	Baraboo	20	
Wilkins, C. A.	Platteville	53	
Wilson, H. J.	Rush Lake	21	12
Winke, Henry	Portage	21	
Young, E. A.	West Salem	8	19
Total (Guernsey, United States)		6,596	5,761

HEREFORD.

ALABAMA.			
Alabama Hereford Farm	Gastonsburg	84	
Jones, Mrs. H. L.	New Market	19	14
Stokley, J. T., Marengo Farm	Demopolis	221	
ARKANSAS.			
Galloway & Gow	North Little Rock	77	2
Neely & Sons, C. T.	Jonesboro	13	
GEORGIA.			
Cummings, P. S., & Sons.	Lela	53	14
Mack, E. E., & Son	Thomasville	97	20
ILLINOIS.			
Baie, Carl	Waterman	24	4
Clark, O. P.	Georgetown	27	7
Freundt, Edward	Hinckley	3	10
Murphy Bros.	Sullivan	32	10
Pinnell, Chas. R.	Kansas	16	4
Rimsnider, C. W.	Hinckley	28	
Swango, Harlan, & Son	Paris	23	2
INDIANA.			
Addington, Clayton	Winchester	16	2
Hickman, C. W.	La Fayette	59	3
Ingle, James O.	Winchester	19	1
Milligan, Samuel	Milligan	54	3
Mullendore & Son, F. R.	Franklin	42	9
Williams & Wright	Farmiland	19	10
IOWA.			
Hastings, W. E.	Iowa City	32	8
KANSAS.			
Blase, Henry	Sylvan Grove	32	11
Brey, Robert	Ozawkie, R. 1	15	1
Betz, H. R.	Enterprise	13	3
Cummings, Wm.	Hesston	32	18
Dunlop, Geo.	Longton	13	4
Dunlop, J., & Sons	do	15	7

HEREFORD—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
KANSAS—continued.			
Lungstrom, Geo.	Lindsburg	88	1
McIntire, Joe. L.	Howard	40	13
Plummer, H. D.	Longton	33	6
Sauder, W. J.	Sabetha	7	24
Tilley, S. W.	Irving	146	8
Waters, C. C.	Wellsville	38	9
Winter, B. M.	do.	25	7
KENTUCKY.			
Beaven, W. B.	Loretto	16	7
Hornsby, Thos. L., & Son	Eminence	41	3
Luce & Moxley	Shelbyville	72	21
May, J. W., & Son	Owensboro	16	
Rollings, Dr. J. D.	La Center	18	2
Rouse Bros.	Paynes Depot	21	4
Swope, Felix H.	Georgetown	21	6
Valley View Farm Co., H. L. Tucker	Central City	19	4
Wadlington, Dr. J. B.	Otter Pond	16	4
Weyenberg, P. C.	La Grange	60	9
White, F. E.	Hopkinsville	20	1
Wilson, J. H.	Eminence	20	2
LOUISIANA.			
Diamond L Ranch	Angie	83	
MAINE.			
Barker, Charles L.	East Vassalboro	32	
Brown, E. O.	Augusta	18	4
MINNESOTA.			
Anderson, L. L.	Balaton	38	5
Bolstad, Selfred	Dawson	17	4
Clinton Falls Nursery Co.	Owatonna	85	12
Detjen, Oscar	Mankato	10	3
Droogsmma, Sam	Princeton	23	9
Erickson, Ole O.	Hartland	2	43
Gallivan, J.	Hugo	13	6
Hanson, Pete	Balaton	13	9
Keller, Harry	Marshall	13	3
Lay, C. W.	Arco	24	12
Leslie, J. J.	Stillwater	24	5
Lidke, Walter	Fairmont	7	8
McCadden, R.	Skyberg	9	19
Melin, Bennett I.	Red Wing	17	2
Meyers, F.	Fergus Falls	21	1
More, Edward, & Son	Blue Earth	133	
Nankeman Bros.	Beardsley	68	4
Oech, Lewis	Winona	35	3
Palmer, W. C.	Tyler	53	2
Phipps, W. H.	Atwater	99	15
Pitcher, Will	Blue Earth	29	21
Potter, L. E., & Son	Springfield	82	6
Riley, L. L.	Fergus Falls	88	
Skarie, Oscar, & Son	Lanesboro	12	19
Slater, R. J.	Winnebago	14	14
Sorenson, C. P.	Balaton	111	14
Soreson, S. J.	Tyler	47	2
Storlie, Geo. L.	Whalan	26	
Sullivan, J. F., & Son	Guckeen	28	3
Waldron, R. G.	Rochester, R. 1.	42	7
Zupp, J. F.	Blue Earth	52	11
MISSISSIPPI.			
Hart, Geo. F. & Jas.	Sandy Hook	78	39
Mount Arista Ranch	Utica	51	
MISSOURI.			
Tuck Bros.	Morrisville	19	25
University of Missouri (beef herd)	Columbia	61	12
MONTANA.			
Attletweed, O. C.	Beach, N. Dak.; ranch, Wibaux County, Mont.	36	4
Clemow, G. M.	Jackson	26	9
Eisaman, John G.	Park City	5	36
Golde, Joe	do.	20	23
Manhattan Ranches Co.	Manhattan	11	425
Montana State College	Bozeman	29	1
Owen, Charles L.	Philipsburg	25	7
Tintinger, Theodore D.	Park City	80	2

HEREFORD—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
NORTH CAROLINA.			
Anthony, H. C.	Burlington	8	4
Miller, B. B.	Mount Ulla	19	10
Rogers, Jas. H.	Roxboro	3	5
NORTH DAKOTA.			
Burkhardt & Schwedler	Omeme	14	
Gilbertson, Swen	Binford	17	19
Kennedy, A. G.	Crete	10	17
Miller, M. R.	Thunder Hawk, S. Dak.	41	6
Moffet, James	Barton	5	1
Munro, Chas.	Crary	18	
Phillips, H. H.	Harvey	43	4
Sebby, T. J.	Fingal	49	29
Tweeten, J. T.	Rolette	93	1
Walton, J. J.	Carrington	24	3
PENNSYLVANIA.			
Carroll, G. W., & Sons	Jackson Center, Maple Grove Farm	47	M
Cochran, R. R.	Jackson Center	5	5
Evans, Harry M.	Jackson Center, R. 19	10	6
Jamison, W. C.	do	1	10
Little, C. R.	do	5	2
McCoy, L. F., & Son	Jackson Center, R. 18	7	12
Thompson, Bert	West Sunbury	13	9
SOUTH CAROLINA.			
Morrah, W. D.	Troy	4	43
Palmer, J. F.	McCormick	27	7
Tillman, B. R., jr.	Trenton	6	1
Wardlaw, J. W.	Wilmington	3	52
Young, J. H.	Clinton	18	12
SOUTH DAKOTA.			
Adams, R. C.	Watertown	2	7
Edmunds, H. C.	Wessington	62	7
Myers, Gregory F.	Chester	12	35
Petterson, O. W.	Watertown	27	5
TENNESSEE.			
Caldwell, James E.	Nashville	57	6
Gugelman Bros.	Winchester	45	6
Hunter, J. M.	Cookeville	6	
Johnson, J. Clyde	Ripley	31	6
Lancaster, J. P.	Lancaster	13	7
Lancaster Bros.	do	11	
Mitchell, M. G., & J. E.	Bolivar	35	
Mitchell, J. R.	Sparta	10	8
Neuhoff, Henry	Nashville	4	8
Robinson, W. J., & Son	Lancaster	29	15
Roberson, John L.	Pikeville	25	9
Smith, J. R., jr.	Fayetteville	95	38
Stokes, S. D.	Ashland City	9	7
Susong, G. L.	Morristown	19	9
Terry, J. W.	Sparta	16	8
UTAH.			
Olsen Live Stock Co.	Ephraim	123	72
Utah Agricultural College	Logan	16	
VIRGINIA.			
Cecil, J. W., & Son	Pennington Gap	32	8
Combs & McNeil	Jonesville	46	
Coyner, Hugh	Waynesboro	29	17
Hill, L. W.	Locust Dale	25	8
Kincaid, J. F.	Leesburg	49	5
Kincaid, M. S.	Ewing	16	8
Litton, A. Frank	Pennington Gap	35	9
Orr, R. S.	do	13	11
Vance, R. C.	Fredericksburg	22	
Virginia Polytechnic Institute	Blacksburg	7	2
Wilson, F. K.	Dot	41	
WASHINGTON.			
Bond & Bro., E. H.	Lost Creek	28	8
McCoy, E. D.	Woods	28	3
Total (Hereford, United States)		5,112	1,800

POLLED HEREFORD.

Name.	Address.	Purebred cattle.	Grade cattle.
Lunsford, Evans.....	Covington.....	28	3
GEORGIA.			
ILLINOIS.			
Apt, Silas.....	Stronghurst.....	12	3
Brown, Clyde E.....	Rushville.....	36	6
Dodds, T. J.....	Stronghurst.....	45	5
Haley, S. F.....	Tiskilwa.....	45	10
Moore, W. P.....	Terre Haute.....	26	2
Painter, C. C., & Son.....	Stronghurst.....	65	7
Painter, F. E.....	do.....	29	9
Painter, J. E., & Son.....	do.....	30	5
Painter, Ralph.....	do.....	137	8
Thorell Bros.....	Blandinsville.....	14	5
Stine, Ed., & Son.....	Stronghurst.....	97	16
Wetterling, A. E.....	do.....	12	3
INDIANA.			
St. John, Jacob.....	Pine Village.....	21	10
IOWA.			
Fritz, R. A., & Son.....	Grinnell.....	56	12
Hol, Peter J.....	Waukee.....	16	2
Johnson, Axel L.....	Manson.....	14	4
Leonard, N. M.....	Waukee.....	39	1
Pistick, J. L.....	Rockwell City.....	14	3
Speer, Barto.....	Waukee.....	9	
NEBRASKA.			
Hatz, J. C.....	De Witt.....	32	8
Total (Polled Hereford, United States).....		777	122

HOLSTEIN-FRIESIAN.

ALABAMA.			
Garrett, D. J.....	Montgomery, R. 2.....	3	18
ARKANSAS.			
Porter, Ben R.....	Fayetteville.....	6	
Porter & Son, H. C.....	do.....	9	
CONNECTICUT.			
Burr, O. P.....	Romford.....	5	21
DELAWARE.			
Cann, Dr. W. E.....	Porters.....	18	
Connors, H. D.....	Middletown.....	6	7
Janvier, Mrs. M. B.....	do.....	18	
Messick, Paul B.....	do.....	22	
Moore, James S.....	do.....	18	
Schrader, G. A.....	do.....	8	
St. Joseph Industrial School.....	Clayton.....	33	
Winterthur Farms.....	Winterthur.....	294	
DISTRICT OF COLUMBIA.			
Catholic University of America.....	Brookland.....		13
Columbia Institution for the Deaf.....	Kendall Green, Washington.....		29
Dorr, John V.....	Twenty-eighth Street and Bladensburg Road NE., Washington.		27
Industrial Home School for Colored Children.....	Blue Plains.....		10
National Training School for Boys.....	Bladensburg Road, Washington.....		32
St. Elizabeth's Hospital Dairy.....	Congress Heights, Washington.....	4	200
United States Soldiers' Home.....	Washington.....	106	
GEORGIA.			
Harms, John W.....	Savannah.....		35
IDAHO.			
Ehlers, E. G.....	Twin Falls.....	1	
Fort Lapwai Indian School.....	Fort Lapwai.....		13
Idaho State Industrial School.....	St. Anthony.....	36	35
Idaho State Mental Hospital.....	Blackfoot.....		22
Reed, S. C., & Daughter.....	Weiser.....		66
University of Idaho Experiment Farm.....	Sandpoint.....	6	13
University of Idaho Dairy Herd.....	Moscow.....	24	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
ILLINOIS.			
Bridge, Clay.....	Orangeville.....	36	3
Frankeberger, J. W.....	Dakota.....	2	29
Frazier, Elmer.....	Urbana.....	17	
Hirtzel, Mrs. Anna.....	Effingham.....	15	13
Illinois Masonic Home.....	Sullivan.....	30	28
Jensen, Joseph P.....	Effingham.....	9	8
Loy, Bliss E.....	do.....	32	
Miller, Mrs. Kate.....	Barrington.....	39	
Parriott, Floyd.....	Orangeville.....	1	14
Sprague, Frank.....	Lockport.....	29	
Vose, H. K.....	Gurnee.....	18	
Wallman, E. P.....	Orangeville.....	15	
INDIANA.			
Fidler, J. L.....	Terre Haute.....	4	13
Goshen College.....	Goshen.....	9	1
Indiana State Prison.....	Michigan City.....	4	29
Julietta Home.....	Indianapolis.....		18
Meeker, Ray.....	Muncie.....	28	
Purdue University.....	La Fayette.....	56	31
Robinson & Son, I. H.....	Portland.....	12	5
Rose Orphans' Home.....	Terre Haute.....	13	4
Seberger, Mathias.....	Crown Point.....	27	9
Seberger, Michael.....	Schererville.....	34	
Seberger, M. J.....	do.....	41	
Thomas, E. E.....	Portland.....	10	2
Turbett, Royse.....	Decker.....	11	3
Williams, E. A.....	Lebanon.....	13	8
IOWA.			
Hulsizer, C. L.....	Des Moines.....		12
Koenig, John.....	Waverly, R. 2.....		25
McCorkle, Bert, & Son.....	Algona.....	30	
Naber, Henry.....	Bancroft.....	4	15
Penick, R. A.....	Chariton.....	31	2
Reeves, E. M.....	Waverly.....	5	
Schroedermeier, H. H.....	do.....	24	5
Seeley, Frank.....	Arlington.....	18	
Smith, C. H.....	Tripoli.....	16	
Wood, R. C.....	Traer.....	15	10
KANSAS.			
Anderson, W. C.....	Tescott.....	4	2
Baker, J. J.....	Bonner Springs.....	2	4
Barnett, J. M.....	Denison.....	8	12
Bowser, P. F.....	Bonner Springs.....	1	10
Blackwelder, C. D.....	Chapman.....		10
Burger, H. D.....	Seneca.....	54	1
Bennett, Jay B.....	Holton.....	8	1
Coe, C. A.....	Cottonwood Falls.....	13	2
Duff Bros.....	Horton.....	10	12
Engle, H. S.....	Abilene.....	7	18
Engle, Nathan E.....	do.....	3	
Engle, A. E.....	do.....	3	10
Engle, J. A.....	Talmage.....	27	5
Greene, M. W.....	Bazaar.....	11	38
Graham, R. H.....	Salina, R. 3.....	3	11
Haas, John.....	Wolcott.....		13
Hixson, Geo. S.....	Iliawatha.....	11	1
Hurlock, Oscar.....	Lincoln.....	5	4
Koenig, Louis.....	Solomon.....	15	
Kansas State Agricultural College.....	Manhattan.....	108	30
Rumford, M. E.....	Hamilton, R. 2.....	6	
Sargent, G. W.....	Kansas City.....	11	11
Treff, C. A.....	Bonner Springs.....	10	29
KENTUCKY.			
Coleman, Charles E.....	Latonia.....		11
Henderson Bros.....	Shelbyville.....	14	
Smith, C. W., & Son.....	La Grange.....	11	
Steele, A. J., & R. M.....	Stanley.....	8	6
Wilson, C. B.....	Smithfield.....	6	20
LOUISIANA.			
Diamond L. Ranch.....	Angie.....	12	8
Shaffer, R.....	Ellendale.....		10
Travis, Dr. R. W.....	Tangipahoa.....	1	16
MAINE.			
Adams, Silas B.....	Portland.....	5	
Bates, Herbert M.....	Bangor.....	1	18
Crowell, J. H.....	Danforth.....		10
Cummings, A. D.....	South Paris.....	23	
Davis, Peter H.....	Bangor, R. 7.....	24	43

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MAINE—continued.			
Dow, Neal.....	North Brooksville.....		11
Dunn, Chas. L.....	North Yarmouth.....	9	6
Eaton, J. P. & R. C.....	Exeter.....	10	7
Elkins, Chas., & Son.....	Gorham.....	8	8
Estes, C. O.....	Brewer.....		10
Getshell, Ralph.....	do.....	1	17
Gillies, D. A.....	Bangor.....		16
Gowell, Wm. H., & Sons.....	Auburn.....	7	9
Hart, R. N.....	Brewer.....		11
Hart, Walter I.....	do.....	1	12
Hobbs, E. T.....	Norway.....	7	
Holyoke, E. E.....	East Holden.....		12
Knightly, H. A.....	Norway.....	4	13
Lewis, J. L., & Son.....	Newport.....	10	13
Lunn, J. H.....	Milltown.....		17
McIntire, L. E., & Son.....	East Waterford.....	48	
Payson, Herbert.....	Portland.....	10	18
Pendexter, J. C.....	Cornish.....	17	
Pennell, L. A.....	Newport.....	4	26
Rowell, W. T.....	Brewer.....		25
Strout, E. H.....	Cumberland Center.....		23
Tucker, Benjamin.....	Norway.....	21	2
Walker, C. W.....	Canton.....	25	
Waterman, C. E., & Sons.....	Auburn.....	58	
MARYLAND.			
Auth Bros.....	Camp Springs.....		30
Bausum, Mrs. F. L.....	Annapolis.....		23
Bellevue Dairy Farms Co.....	Hyattsville.....	24	60
Crum, H. C.....	Walkersville.....	5	18
Crum, Millard E.....	do.....		21
Dade, Roger L.....	Lander.....	8	35
D'Arago, Pete.....	Forestville.....		33
Doub, M. B.....	Hagerstown.....	1	12
Downey, Ira.....	Williamsport.....	5	15
Eldridge, C. V.....	Hagerstown.....	13	5
Elliott, B. H.....	Annapolis.....	1	54
Fawley, H. C.....	Lander.....		32
Hahn, Melvin G.....	Walkersville.....		24
Horine, Millard H.....	Jefferson.....		14
Miller, Wm. G.....	Frederick.....		11
Neff, J. W.....	Cumberland, R. 3.....		25
Ramsburg, A. B.....	Walkersville.....		16
Ramsburg, Geo. L.....	do.....		12
Roulette, J. Fred.....	Sharpsburg.....	12	
Ruppert, J. H.....	Burnt Mills.....	1	54
Smith, Geo. L.....	Benson.....	33	
Snoots, Roger.....	Lander.....		13
Sponsellor, J. A.....	Walkersville.....	1	21
Stockman, W. D.....	Lander.....	10	3
Thompson, John G.....	Landover.....	8	36
Wheelwright, J. H.....	Baltimore; farm at Ellicott City.....	16	
Wright, W. S.....	Annapolis.....	1	45
Zimmerman, A. D.....	Walkersville.....		11
Zimmerman, Edw. E.....	do.....	1	15
MASSACHUSETTS.			
Ellis, John G.....	Lee.....	11	10
MICHIGAN.			
Balduff, G. F., & Son.....	Dimondale.....	11	
Barnett, F. A.....	Rochester.....	38	25
Barnum, Harold H.....	Woodland.....	14	
Bazley, John.....	319 Atkinson Avenue, Detroit.....	54	
Benson, E. B.....	Munson.....	23	
Berry, E. W.....	Oak Grove.....	15	
Black, A. R., & Son.....	Lansing.....	23	
Boven, C.....	Howell.....	24	
Bowman Bros.....	Star City.....	6	
Browning & McPherson, Oakdale Farm.....	Howell.....	23	
Buckham Bros.....	Kalamazoo.....	6	
Chase, A. E., & Sons.....	St. Johns.....	23	20
Collier, Edgar.....	Fowlerville.....	14	
Cook, Charles I.....	do.....	11	
Cornell, Thurber.....	Howell.....	19	1
Couzens, James, Wabeek Farms.....	Pontiac.....	137	
Cutler, F. D.....	Wayland.....	69	
Cirr, Andrew T.....	Lake Odessa.....	19	
Ferris, P. F.....	Big Rapids.....	4	5
Filkins, A. T.....	Oak Grove.....	9	2
Gehring, Henry.....	Howell.....	22	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MICHIGAN—continued.			
Gilkes, T. B.	Howell	20	.....
Gregory & Borden	do.	20	.....
Griffin, Wm. I.	do.	19	.....
Haller, H. M.	do.	16	1
Hanchett, Benjamin	Grand Rapids	59	.....
Hatch, Wm. B.	Ypsilanti	28	.....
Heeg, Charles S.	Howell	14	.....
Henney & Lepard	Lake Odessa	14	.....
Holmes, O. H.	Howell	9	.....
Holmes, S. R.	Fowlerville	10	1
Howard, F. B.	Ionia	8	3
Hunsberger, C.	Grand Rapids	32	.....
Hunsberger, Lloyd	Star City	14	.....
Hunsberger, Titus	Caledonia	9	2
Jenkins, F. S., & Son	Eagle	12	.....
Jordan, Frank	Woodland	7	.....
Jordan, Willard	do.	22	.....
Kaboos, Wm.	Ada	11	.....
Killinger, Arwin	Fowlerville	22	.....
Knooihuizen, Ray B.	Holland	16	.....
Leggett, Thos.	Pontiac	18	6
McDonough, Wm. R.	Howell	11	.....
McPherson, M. J., Brookvale Farm	do.	23	.....
Marr, E. W., & Sons	do.	8	16
Martin, Fred. E.	Owosso	9	1
Martin, James	Howell	14	.....
Meyer, Frank E.	do.	3	26
Michigan Agricultural College	East Lansing	86	.....
Michigan Tuberculosis Sanatorium	Howell	12	41
Miller, W. B.	do.	4	4
Monteith, Robert	Martin	15	.....
Monroe & Lewis	Owosso	15	.....
Newberry State Hospital	Newberry	96	.....
Norton, Miss Helen S.	Howell	15	1
Norton, H. W., & Son:			
Farm No. 1	do.	34	.....
Farm No. 2	do.	18	4
Peavy, Wm. H.	do.	20	.....
Perrine, Arthur H.	Rives Junction	5	13
Pfau, Alban R.	Howell	29	.....
Reader, W. B.	do.	7	.....
Reed, C. P.	do.	15	5
Reed, Howard C.	do.	11	.....
Risch, Chas. H.	Brighton	17	.....
Tooley, Jay B.	Howell	19	.....
Van Huizen, John H.	Grand Haven	4	11
Van Keuren & Durfee	Howell	32	.....
Washburn, H. A.	Moline	23	.....
Waters, Dudley E., Maryland Farm	Grand Rapids	103	.....
Wessinger, Benj.	Oak Grove	6	.....
Wessinger, Frank	Howell	7	.....
White, C. H.	do.	13	.....
Willard, M. W., & Sons	Grand Rapids	19	.....
Williams, F. H.	Allegan	17	.....
Winslow, Percy	Hastings	24	.....
Witty, W. J.	Howell	17	.....
Woodard, Henry M.	do.	11	.....
Woodworth, L. M.	Rockford	12	.....
Zwinek, Erwin	Fowlerville	22	.....
MINNESOTA.			
Anderson, Wallie	Lake Crystal	4	22
Baltus, Mat.	Stewart	3	33
Bauernfeind, G. B.	Norstrand	31	1
Bednor, John	Shevlin	.....	10
Beerbower, Fred	Thief River Falls	13	4
Beihoffer, E. C.	Glencoe	1	27
Bender, L.	Wheaton	6	22
Berglund, Alf.	Albert Lea	36	.....
Bittner, Walter	Winona	.....	15
Block, August	Hutchinson	24	7
Bloomer, E. R.	Morristown	3	16
Boeckman, Dr. Egil	White Bear Lake	25	.....
Bohn, Herman	Winona	.....	15
Bonham, E. E.	Park Rapids	19	.....
Boynton, W. D.	Medford	15	7
Brosious, E. J.	Stillwater	20	.....
Brown, Andrew	Albert Lea	1	42
Brush Bros.	Amboy	16	13
Brush, Geo. H. R.	Owatonna	.....	22
Bulfer, E. G.	Garden City	1	23

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA—continued.			
Carlson, J. E.	Taylor Falls	4	21
Carman, Ed. E.	Ada	7	2
Chambers, Alex.	Owatonna	26	
Christiansen, J. A.	Westbrook	14	5
Christgan, John	Dexter	4	31
Copp, Fred.	Thief River Falls	1	19
Crane, R. P.	Austin	19	
Cusey, R. F.	Detroit	5	15
Dalin, Andrew	Forest Lake	22	2
Dascher, Geo. R.	Buffalo Lake	8	13
Denzer, Val.	Minnesota City		23
Dobelstein, Clinton	Winona	1	14
Dunton, A. M.	Bagley		13
Eldevik, K. A.	do.		21
Ellis Estate, A. V.	Austin	30	32
Enright, M. L.	East Grand Forks	62	2
Erdahl, C. C.	Frost	12	
Evenson, N. O.	Litchfield	5	35
Fairbanks Bros.	West Concord	22	
Faulkner, M. A.	Albany	12	
Filks, Theo.	Biscay	39	11
Frodahl, H. P.	Shevlin		11
Gaulke, Carl	Wheaton		10
Gehlen, Paul	Glencoe		28
Goodhue, R. B.	Dennison	28	
Graham & Hansen	Rochester	24	
Grahamholm Farm	do.	90	
Grass, N. P.	Amboy	24	
Gray, N. H.	Fergus Falls	20	
Hagadorn, Henry	Winona		24
Hagen, H. B.	Glencoe	5	28
Hanson, O. W.	White Bear Lake	15	10
Harpel, Wm.	Glencoe	13	8
Harris, Ed.	Winona	1	19
Hatz, Christ.	Glencoe	6	22
Hegg, Carl	Shevlin		10
Henderson, J. G.	Albert Lea	5	21
Hendricks, Edwin F.	Mayer	1	15
Hendricks, O. E.	do.	17	
Hill Estate, J. J.	St. Paul		28
Hopkins, E. L.	Withrow	5	25
Hovdesven, A.	Cottonwood	23	
Hoyne, H. A.	Albert Lea	27	8
Hoyum, Albert O.	Dawson	5	22
Hunter Bros.	Northfield	29	
Jacobson, John	Franklin	10	15
Janisch, J.	Medford	14	5
Jeans, William	Withrow	30	
Jergens, Henry	Biscay	23	26
Johnson, Jense	Lake Crystal	16	
Johnson, John G.	Albert Lea	21	16
Jorgenson, H. F.	Wahkon	1	10
Judin, Victor	Shevlin	1	19
Keene, J. L.	Mankato	15	
Kietzer, Herbert H.	Vernon Center	9	3
Klein, Wm. F.	Chanhasen		20
Knopp, C.	Winona		10
Kokke, Henry J.	Onamia	22	
Kroneman, Max.	Fergus Falls	8	21
Kuehl, W. F.	Albert Lea	10	9
Landon, F. C.	Rushford	40	
Lashbrook, Alfred	Northfield	18	
Lay, A. S.	Lake Benton	18	26
Leach & Crist	Ellendale		17
Lewis, W. S.	Garden City	13	10
Lohman, Victor	Lake Elmo		31
Lord, Bertrand	Forest Lake	32	5
Lunde, Carl K.	Hayward	13	7
McCargar, G. A.	Judson	27	
McDonald Bros.	Medford	1	18
McNabbs, P. H.	Elk River	1	32
McWalter, Robert W.	East Grand Forks	92	
Mankato Holstein Farms	Mankato		13
Mathces, H. A.	St. Hilaire	74	
Maywood Farm	Rochester	11	8
Meade, Fred. C.	Alexandria, R. 4	23	
Mead, R. W.	Stillwater		12
Menzel, Otto	Hamburg		18
Michael, John	Winona		353
Miller, Al.	Minnesota City		

HOLSTEIN-FRIESIAN - Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA—continued.			
Miller, J. J.	Morristown	20	.....
Miller, S. R.	Freeborn	1	14
Miller, S. R., & Bosshardt, R. D.	Morristown	19	2
Mills, R. N.	Buffalo	7	11
Minnesota Holstein Co.	Austin	54	.....
Minnesota State Public School	Owatonna	2	55
Molter, E. W.	French	10	19
Moscrip, W. S.	Lake Elmo	88	.....
Mueller, H. A.	Nerstrand	23	2
Noper, V. C.	Thief River Falls	.....	35
Norris, B. A.	Anoka	6	9
Oestrich, Ferdinand	New Germany	.....	17
Olson, C. M.	Blue Earth	3	12
Oppliger, E. J.	Forest Lake	20	.....
Osborne, F. H.	Albert Lea	8	21
Overgaard, P. H.	Lerdal	10	18
Parks, Edw. C.	Amboy	1	18
Pheiffer, M. J.	Winona	.....	20
Raff & Priebe	Shevlin	3	11
Ramer, W. S.	Barnum	16	.....
Randall Bros.	Lake Crystal	49	.....
Rath, C. H.	Wykoff, R. 2.	1	15
Renz, E. O.	Biscay	24	1
Riber, F. W.	Bricelyn	2	12
Roese, Clarence	Hazel	.....	11
Rolen, John P.	Clinton	19	2
Rosendahl, Ben.	Thief River Falls	.....	10
Ruble & Sons, F. S.	Albert Lea	39	.....
Rud, C. L.	Viking	7	14
Rued, Hans	Thief River Falls	2	12
Sanger, Matt	Mankato, R. 3.	4	10
Satre Bros.	Frost	6	14
Satre, F. T.	St. Hilaire	1	13
Schmidt Bros.	Minnesota Lake	19	.....
Schneider, Arthur	Lake Elmo	13	11
Schneider, Fulbert	do	7	12
Schreiber, John	Winona	.....	18
Schroeder Farms, E. C.	Moorhead	80	.....
Schroeder, Hugo W.	Grand Meadow	25	.....
Schumacher, H.	Winona	.....	13
Schwinghammer, J. A.	Albany	19	6
Seath, I. H.	Freeborn	10	24
Seath, S. H.	Hartland, R. 1.	8	14
Seeman & Sons	Utica	10	9
Spaulding, C. L.	Warren	54	23
Spear, C. C.	Elk River	13	5
Spirit Hill Dairy Co.	Jordan	1	79
Starks, A. O.	Dexter	4	13
Steele & Son, F. C.	Alden	14	14
Steidl Bros.	Moorhead	13	.....
Stensrud, Edw.	Watson	20	.....
Stitts, Wm.	Little Falls	5	12
Sugden, Wm.	Hallock	19	.....
Sundberg, B. E.	do	34	36
Tasche, Lambert	Glencoe	.....	25
Taske, Louis	do	1	22
Timm, E. J.	Thief River Falls	.....	23
Tyner & Son, J.	Randolph	20	12
Volkart, Walter	Winona	.....	11
Von Wald, Clarence A.	Nerstrand	.....	28
Von Wald, H. C.	do	28	.....
Walker, Chas. E.	Glencoe	29	.....
Warren, C. M.	Vernon Center	.....	12
Watson, Mrs. Ida W.	Northfield	18	5
West Central Station School	Morris	14	.....
Wilde, F. R.	Lake Crystal	4	14
Wilk, Martin E.	Georgetown	7	26
Williams, Evan E.	Lake Crystal	20	13
Winar State Asylum	Willmar	2	43
Winship Stock Farm Co.	Owatonna	33	.....
Wright, William	Fergus Falls	22	.....
Zenk, John	Winona	.....	5
Zenk, Wm.	do	1	17
Zerfoss, D. J.	Wahkon	.....	11
Zierke, Wm.	Glencoe	4	16
MISSISSIPPI.			
Hoskins, H. C.	Greenwood	9	1
Mississippi Agricultural and Mechanical College	Starkville	15	18
Wackoff, W. G.	Meridian	12	17

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MONTANA.			
Bitter Root Holstein Co.	Hamilton	42	
Cope, T. L.	St. Ignatius	15	27
Davis, M. K.	Huntley	1	14
Dorr, A. C.	Miles City	4	20
Hart, J. T., & Son	Power	36	12
Hoag, Henry J.	Kalispell	6	
Loud, C. H.	Miles City	50	6
McDermand, E. F.	Huntley	9	16
Maier, Mrs. Paul	Butte	74	
Montana State College	Bozeman	35	
Montana State Industrial School	Miles City	26	57
Pope, G. B.	Glendive	12	58
Skaggs, U. S.	Huntley	7	9
United States Experiment Station	do.	23	14
NEBRASKA.			
Frazeur, Allen, & Son	Fort Crook	6	10
Frazeur, P. A.	do.	1	13
Prime, G. A.	Arapahoe	37	18
Wiebe, Jacob	Beatrice	5	3
NEW JERSEY.			
Forsgate Farms	Jamesburg	80	
New Jersey State Prison	Leesburg		17
New Jersey State Home for Feeble-Minded Girls	Vineland		31
New Jersey State Sanatorium	Glen Gardner		42
New Jersey Reformatory	Annandale		19
New Jersey State Village for Epileptics	Skillman	29	98
New Jersey Reformatory for Women	Clinton		28
New Jersey Reformatory	Rahway		32
Sudder, Mrs. H. C.	Trenton Junction	36	
NEW YORK.			
Gowanda State Homeopathic Hospital	Collins	41	117
Hawley & Murphy	Liverpool	26	
Halliday, C. W.	North Chatham	33	
Karpinski, Henry	Oswego	60	
Sherman, G. A.	Springville	1	18
Smiley, Daniel	Mohonk Lake		22
Somers, L. H.	Onchota	2	17
Walrath, J. J.	East Springfield	21	
NORTH CAROLINA.			
Barbee, B. W.	East Durham	1	27
Carr, Julian S.	Hillsboro		29
Carter Bros.	Asheville	10	13
Carter, Elmer	Asheville, R. 1	11	10
Greenwood, J. B.	Biltmore		12
Hudgins, M. J.	Asheville, R. 1		22
Kirkpatrick, H. D.	Charlotte		36
Pemberton, Tom	Greensboro	7	33
Roberts, J. T.	Biltmore		21
Stevens, Mrs. Jessie	Greensboro	24	7
Stradley, J. R.	Asheville, R. 1		13
Turnage, J. R.	Durham		27
Wilson, C. T.	Biltmore		24
NORTH DAKOTA.			
Armman, K. P.	Edinburg	5	11
Chizek, H. E.	Wahpeton	7	3
Christianson, John	New Salem	41	2
Dries, H. I.	Braddock	2	11
Edman, H. J. & Harry	Gwinner	13	
Ellingson, Thor	Valley City		23
Gaebe, Frank	New Salem	27	
Garske, Louis J.	Bismarck	7	10
Gurr, W. W.	Lawton		13
Holle, H. W.	Youngstown	19	
Howden, Geo.	Sutton	5	6
Huffman, R. B.	Minnewaukan	26	
Indian School	Fort Totten	1	23
Do.	Fort Yates	1	44
Jackson, J. P.	Grafton	11	
Jones, N. H.	Hankinson	10	48
Klusman, John	Youngstown	21	
Kroeger, Fred	do.	15	
Kroeger, Henry	do.	7	
Lakson, Hans	Park River	6	4
McCullough, J. T.	Crosby	12	
McLarty, A. J.	Starkweather	8	2

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
NORTH DAKOTA—continued.			
Manikowski, Wallace	Mooreton	25	.....
Martin & Howell	Powers Lake	19	33
Meyer, Dick	Youngstown	7	9
Michales, F. C.	do.	20	.....
Muske, H. J.	Grand Rapids	12	.....
Neas, William	New Salem	11	10
Normal School	Valley City	9	6
Ohm, T. N.	Lisbon	18	.....
Peterson, Niels P.	Oberon	11	6
Rood, Ed.	Valley City	10	11
Sawtell & Stowell	Flasher	33	15
Schwarting, H.	Youngstown	21	.....
Simonitch, F. J.	Flasher	10	7
Spionskowski, F. J.	Braddock	17	4
Thorn, Edwin	Binford	13	.....
Van Houten, Dr. J.	Valley City	30	6
Welsh, Frank	Grafton	14	1
Wilkins, Dick	Youngstown	9	14
OHIO.			
Baer Brothers	Marshallville	15	1
Battles, Lyle H.	Chesterland	6	10
Bernath, Geo. & R. I.	Wauseon	12	.....
Biddle & Son, W. L.	do.	23	.....
Buck, Frank	Metamora	10	.....
Burkholder, A. M.	Wauseon	14	.....
Burkholder, Joseph	do.	27	.....
Burkholder, John	Archbold	9	2
Carroll, Henry T.	Swanton	1	9
Cone, J. M.	West Farmington	33	.....
Crowe, H. E.	do.	1	10
Dillon, R. E.	Williamsfield	21	.....
Doner, Pat.	Sandusky	1	13
Fairchild, Osro	Holland	19	.....
Fulton County Infirmary	Wauseon	9	9
George, H. C.	Lebanon	1	9
Gould, Harry	Wauseon	20	3
Grover, B. E., & Nofziger, P.	do.	7	7
Ham, Henry	do.	8	15
Hitchcock, C. W.	Mentor	20	.....
Keifer, George M.	Monclova	7	3
Kelsey, C. K.	Swanton	3	8
King, H. W.	Mentor	68	.....
Lauber, Floyd	Archbold	4	8
Lauber, M. C.	Fayette	10	1
Lee & Son, Geo. W.	Morenci, Mich.; farm, Fulton County, Ohio.	6	1
McElheny, George S.	Tiffin	19	.....
Mantle & Mantle	Painesville	15	2
Marks & Son, E. D.	Morenci, Mich.; farm, Fulton County, Ohio.	22	.....
Marsh, R. L.	Kent	.....	12
Merkel, J. F.	do.	17	2
Mohr, Lloyd	Wauseon	.....	12
Murray, T. C., jr.	do.	3	9
Myers, Ben. E.	Marysville	29	.....
Neiding, John H.	Vermilion	5	2
Nichols, L. W.	Garrettsville	17	.....
Parker, L. J.	Sandusky	4	3
Paul, J. L.	Norwalk	4	5
Perry, Joe	Wauseon	3	7
Pierce, L. S.	Warren	25	.....
Prindle, O. L.	Westview	17	.....
Seibel, Fred. E.	Delta	13	.....
Smith, Mrs. H. B., & Jones, A. E.	Swanton	15	.....
Smith, J. A.	Williamsfield	18	1
Smith, Wm. F.	Swanton	11	1
Spring, E. E.	Wauseon	18	.....
Standish, William H.	Lyons	12	.....
Steiner, Clarence	Pandora	12	.....
Warner, George B.	Wellington	50	.....
Woodin, F. M.	Chardon	6	3
Woods & Son, W. B.	Monclova	31	.....
Zehring, O. O.	Germantown	18	.....
OREGON.			
Hess Brothers	Astoria	50	56
McKeown, David	Gresham	18	.....
Mullenhoff, H. G.	do.	10	9

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
PENNSYLVANIA.			
Armstrong, A. D.	Grove City, R. 13.		9
Beil, W. A.	Greenville, R. 49.	5	
Boyd, S. B.	Sandy Lake, R. 25.		13
Brown, J. B.	Titusville.	2	11
Campbell, J. Floyd.	Titusville, star route.		15
Connor, Edgar H.	Grove City, R. 11, White Star Dairy Farm.	6	13 10
Dale, W. C.	Grove City, R. 13, Mapledale Farm.		
Decker, H. R.	South Montrose, Meadowsides Farm.	6	6
Gamble, C. A.	Fredonia, R. 37.	9	
Glenn, Fred. T.	Voland, R. 1.	8	9
Glenn, Jno. A.	Mercer, R. 6, Glenview Farm.	4	11
Headley, M. H.	Fredonia, R. 37.	7	12
Hoover, F. B.	Diamond, R. 2.	1	10
Hoyt, Mrs. F. B.	Townville.		10
Hummer, A. K.	Titusville, R. 2, Windfall Farm.		16
Jones, B. F., & Son.	South Montrose.	7	22
Kerr, Clyde F.	Centerville, R. 1.	19	
Lamond, James.	Grove City, R. 16.	3	28
Lorenz, E. C.	Centerville, R. 1.	6	3
McDowell, F. H.	Grove City, R. 11.		10
McClelland, R. T. & W. C.	Mercer, R. 6.	9	9
McClelland, Saml. & S. T.	Grove City.		22
McCoy, Howard.	Slippery Rock, R. 5.	3	14
Minner, R. E.	West Middlesex.		10
Montgomery, H. W.	Grove City, R. 16.		11
Montgomery, James.	Grove City, R. 17.	6	14
Morris, E. M.	Sandy Lake, R. 25.	3	11
Myer, James F.	Titusville, star route.		10
Obert, F. W.	Diamond, R. 2.		10
Patterson, G. W.	New Galilee, R. 1.	9	12
Patton, B. J.	Sandy Lake, R. 25.	2	13
Pearson, J. C.	Grove City.	1	11
Pennsylvania State College.	State College.	1	13
Searing, Geo.	Harrisville.	24	
Strawbridge, Oliver.	Titusville, star route, Sunny Banks Farm.	8	10
Tinker, W. A.	Grove City.	1	13
Weber, A. C.	Grove City, R. 11, Three Pine Farm.	5	
Wheatall, H. R.	Titusville, R. 2.	10	8
White, W. D.	Grove City, R. 11.		17
White, W. J.	Grove City, R. 16.	9	5
Wilson, M. W.	Titusville, star route, Longview Farm.	4	13
Younkins, Frank.	Volant, R. 1.		11
Zittle, C. F.	Jackson Center.	1	12
		3	11
SOUTH CAROLINA.			
Bee, Sandiford.	Charleston.		
Lynah, R. Norris.	do.	2	25
McLeod, W. N.	do.		28
Maxwell, J. L.	do.	1	29
Welch, A. L.	Spartanburg.	3	11
Willard, J. T.	Charleston.		41
Winn, C. F.	Spartanburg.	26	5
	Ward.		15
SOUTH DAKOTA.			
Crothers, P. R., & Son.	Hetland.	33	
Johnson, Frank E.	do.		
Potter, Floyd.	Andover.	20	
State College and Experiment Station,	Vivian.	3	32
Vivian Farm.		5	2
Stone, Carrie E.	Watertown.		
		1	13
TENNESSEE.			
Alexander, A. E.	Humboldt.		
Knapp School of Country Life.	Nashville.	6	3
Parrish, U. O.	Union City.	23	
Parrish, W. A.	do.	23	9
Western Tennessee Experiment Station.	Knoxville.	54	3
University of Tennessee.		13	
		18	
UTAH.			
Aldous, Geo.	Huntsville.		
Blake, S. H.	Provo.		13
Blake, Jas. T.	do.		17
Cook, Sam.	Layton.	1	12
Holdaway, Frank.	Provo.		9
Knudsen, Benj.	do.	3	23
Nelson Bros. Co.	Woods Cross.	1	30
		21	3

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
UTAH—continued.			
Pond, Martin.....	Richmond.....	24	23
Snyder, J. M.....	Provo.....	1	15
Stone, J. O., & Sons.....	do.....	5	25
VERMONT.			
Brooks, H. K.....	St. Albans.....	37	11
Dewey, G. G.....	Royalton.....		10
Hunt, Geo. A.....	Vergennes.....		33
Lovejoy, Henry.....	Hardwick.....		21
Miller, Ellery M.....	Coventry.....		23
Morton, Frederick B.....	St. Albans.....	12	16
Otis, P. W.....	Vergennes.....	8	3
Rushford, Otis.....	Montgomery.....		19
Safford, D. N.....	Jeffersonville.....	23	
Vosburgh, Arthur W.....	South Burlington.....		28
Wassen, Mrs. W. L.....	Waterbury.....	22	6
VIRGINIA.			
Allen, H. C.....	Nokesville.....	10	18
Ayers, Floyd.....	Williamsburg.....		25
Barbour, G. W.....	Somerset.....	1	55
Beach, G. W.....	Fairfax.....		24
Beard, E. E.....	Sterling.....		17
Beaumont Farms.....	Michaux.....		51
Bell, T. L.....	Round Hill.....	1	22
Berry Bros.....	McLean.....	23	17
Blair, Miss H. E.....	Max Meadows.....		39
Blincow, J. T., jr.....	Sterling.....		12
Blundell, G. W.....	do.....		12
Boucher, Towney.....	McLean.....		16
Bowman, F. E.....	Remington.....	1	46
Bowman, J. M.....	Vienna.....		15
Bowman, Samuel, & Son.....	Boone Mill.....	7	2
Bready, B. H.....	Herndon.....	8	19
Britton, R. S.....	Nokesville.....		11
Bubb, A. M. C.....	Ocequan.....		32
Buffalo Mineral Springs.....	Buffalo.....		33
Carroll, J. T.....	Richmond.....	7	39
Carter, Shirley.....	Ashland.....		28
Chrisman, W. G.....	Burkeville.....		12
Cline, W. A.....	Nokesville.....		21
Clopton, N. V.....	Bealeton.....		13
Conner, E. R.....	Manassas.....		38
Crabill, H. S.....	Toms Brook.....	4	
Diehl, J. I.....	Nokesville.....		11
Dorrell, Clarence.....	Sterling.....		20
Duane, J. H.....	Ford.....	5	26
Eastern State Hospital.....	Williamsburg.....	3	80
Edwards, S. E.....	Sterling.....		18
Elliott, H. C.....	Roanoke.....	28	2
Ellmore, W. H.....	Herndon.....	2	22
Epard, S. D.....	Woodstock.....	8	
Episcopal High School.....	Alexandria.....	3	17
Eubank, R. H.....	Round Hill.....		27
Ficklin, J. D.....	Bealeton.....		19
Fields, A. J.....	Remington.....		14
Fifield, S. E.....	do.....	2	30
Finks, J. J.....	do.....		17
Fitzgerald, E. B.....	Gretna.....	5	25
Flora, B. T.....	Boone Mill.....	4	21
Flore, J. T.....	Nokesville.....		22
Francis, W. S.....	Hamilton.....	1	21
Frazier, J. A.....	Mitchell.....		29
Funkhouser, F. M.....	Strasburg.....		11
Gardner, C. E.....	Rapidan.....	37	
Garman, G. E.....	Nokesville.....		17
Garnette, J. M.....	Charlottesville.....		28
Gilley, Edwin.....	Williamsburg.....		11
Goss, E. L.....	Somerset.....		70
Graham, Ashby.....	Fairfax.....		25
Graves, F. S.....	Orange.....	1	48
Graves, R. L.....	Culpeper.....	1	21
Gregory, G. C.....	Richmond.....		27
Griffith, F. D.....	Brandy Station.....	2	
Griman, Miss N. S.....	Woodberry Forest.....	1	20
Groves, H. M.....	Remington.....		14
Groves, W. H.....	do.....		10
Harly, W. E.....	Keysville.....	1	29
Harrison, R. L.....	Herndon.....		28
Hawthorne, J. C.....	Wellville.....		14
Heatwole & Lahman.....	Harrisonburg.....		21

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
VIRGINIA—continued.			
Hessick, E. W.	Herndon		12
Hickerson, J. B.	Remington		10
Hidden, J. G.	Culpeper	6	69
Hopkins, J. W.	Charlottesville		17
Hubert, Wm. E.	Blacksburg		16
Iden, B. F.	Manassas	1	30
James, J. M.	Remington		16
Johnson, Vincent	Manassas		10
Kegley, F. B.	Wytheville	14	13
Kesler, W. M.	Beaeton		29
Kidwell, G. W.	Hunter		14
Kirk, T. C.	Midland		13
Lee, J. B., & Sons	Hanover	16	37
Leigh, H. B.	Vienna		19
Lewis, C. F. M.	Manassas		13
Lewis, J. F.	do.		15
Leonard, A. A.	Midland	14	2
Lynn, L.	Sterling		25
McArtor & Smith	Purcellville	3	25
McMichael, A. E.	Nokesville	1	20
McMichael, A. J., & Son	do.	3	26
McMurdo, A. E.	Charlottesville	4	15
Mahoney, M. A.	Mitchells	25	18
Makely, J. W.	Fairfax		24
Mankey, William	Remington		18
Manuel, J. B.	Nokesville	2	19
Marchant, H. L.	Healys	9	8
Mebane, W. N.	Dublin	1	67
Miller, Louis	Remington		27
Miller, O. K.	Nokesville	1	24
Miller, W. S.	do.		27
Moreland, M. A., & Bro	Vienna		12
Morgan Brothers	Catawba Sanatorium		41
Murphy, J. W.	Herndon		16
Myers, B. F. A.	Fairfax		15
Nance, A. S.	Evington		14
Neale, W. D.	Beaeton	4	17
Norman, D. H., & Sons	Chatham	9	28
Oden, W. B.	Beaeton		22
Payne, A. C.	Purcellville	1	11
Payne, R. H.	Remington		16
Payne, Thos. K.	do.		15
Peek, F. E.	Herndon	1	25
Peek, H. O.	do.		12
Perry, W. H.	Victoria		39
Peterson, A. P.	Norge		15
Piedmont Sanatorium	Burkeville	1	22
Pierce, V. B.	Fredericksburg	1	17
Retzer, W. W.	Herndon		24
Ritchie, Mrs. M. J.	Burke		30
Robey, E. L.	Herndon		28
Ryland, W. S.	Manassas		25
Sager, A. V.	Fairfax		15
Scott, A. R.	Richmond	10	46
Shelley, H. P.	Denbigh		17
Shenk, A. P.	do.	4	2
Shepherd, M. J.	Nokesville		19
Shuler, Mrs. Aliee	Motley	16	6
Shumate, O.	Beaeton	1	55
Slusher, Henry	Manassas		16
Solomon, M. M.	Sterling	1	13
Souder, M. C.	Purcellville	1	20
Southwestern State Hospital	Marion	11	35
Stanford, M. F.	Calverton		39
Summers, C. M.	Catlett	1	22
Swartz, F. M.	Nokesville		21
Taylor, J. P.	Orange	121	
Taylor, Mrs. W. W.	Remington		17
Thomas, J. B.	Middleburg	82	8
Thompson, J. D.	Herndon	3	27
Thompson, W. J.	Round Hill		22
Timberlake, E. J.	Dumbarton		34
Torreyson, A. D.	Ballston	1	32
Trammel, French	McLean	1	19
Trenis, L. W.	Catlett	20	33
Vansant, J. F.	Hampton	1	29
Virginia Hot Springs Co.	Hot Springs	1	97
Virginia Polytechnic Institute	Blacksburg	57	
Virginia School for Deaf and Blind	Staunton	14	15
Virginia State School for Colored Deaf and Blind Children	Newport News		10

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
VIRGINIA—continued.			
Waddell, H. G.	Charlottesville.		14
Walker, F. S.	Woodberry Forest.	81	24
Walker, Wilbur S.	Fairfax.		11
Wambersie, A. C.	Orange.	12	18
Wambersie, E. E.	do.	11	46
Weaver, J. E.	Remington.		17
Weimer, Amzi.	Beauleton.		10
Wertz, J. G.	Salem.	10	17
Wilkins, William.	Wytheville.	2	61
Willcoxon, H. P.	Fairfax.		52
Willis & Gratan	Rapidan.	3	24
Woodberry Forest Farm	Woodberry Forest.	2	69
Wright, F. A.	Staunton.	9	16
Yoder, D. S.	Oysterpoint.		37
WASHINGTON.			
Benson, A.	Lynden.	21	
Benson, E. F.	Prosser.	6	19
Crawford, James.	Colville.	1	19
Donaldson, E. A.	Chehalis.	5	
Evans, H. J.	Ferndale.	16	
Hamilton, W. A., & Sons.	Chehalis.	24	
Nisbet, Hugh.	Chimacum.	34	
Peabody, Charles.	Rothell.	60	
Rector, W. I.	Tono.	9	
Selle, Gus.	Colville.	24	
Smith, A. E.	Sumas.	108	
Tualco Valley Farm	Monroe.	26	
West, Byron A.	Mount Vernon.	16	
WEST VIRGINIA.			
Englehard, Mrs. Mary	Elm Grove.		25
Montgomery, M. T.	Wheeling, R. 2.	16	1
Schmidt, Geo.	do.		16
Sisters of Good Shepherd.	Wheeling.	2	7
WISCONSIN.			
Anderson, A.	Larsen.		17
Anderson, A. M.	Whitewater.	34	
Barron County Farm.	Barron.	4	18
Brigham, C. I.	Blue Mounds.	7	
Burbach, J. W.	Waukesha.	31	
Buss, Julian B.	Reeseville.	15	6
Caffisch, F. A.	Baraboo.		21
Carey, James J.	Larsen.	8	17
Coogan, Wm., & Sons.	Watertown.	54	
Cook, George L.	Burlington.	24	
Cook, Jos. C.	do.	23	
Coolidge, D. C.: Farm No. 1.	Downing.		162
do.	do.		73
Darcey, Francis.	Watertown.	18	
Darcey, Thomas.	do.	24	
Elmer, Ivan.	New Glarus.	45	2
Evenson, Newell.	Sheridan.		19
Fehling, E. O.	Juneau.	19	
Ferg, Fred. W.	Manawa.	11	6
Floistad, Knute.	Iola.		21
Fraser, Geo. A.	Lake Beulah.	5	6
Gray, Louis.	De Forest.	28	
Gunderson, Maria E., & Son.	Oconomowoc.	35	
Haase, Chas., & Sons.	Neenah.	4	20
Haskell, Chas. F.	Waterloo.	30	
Haskell, M. T.	Waterloo, Fall Meadow Farm.	27	
Hildeman, Otto.	Watertown.	9	13
Holman, C. R.	Waupaca.	5	11
Holman, Reuben.	do.	5	11
Huber Bros.	Watertown.	23	40
Jacobson, L. B.	Chetek.	18	21
Jenson, John.	Waupaca.		22
Jones & Alt.	Watertown.	22	
Jones, O. L.	Pickett.	4	27
Krahenbuhl, F. J.	Barron.	19	
Kreimann, Edw.	Brillion.	7	2
Lac du Flambeau Indian School.	Lac du Flambeau.		15
Larson, Almo J.	Waupaca.	2	15
Lee, P. A. G.	Deerfield.	2	16
Lehmann, Theo.	Watertown.	28	
Le Juenic, John.	Rice Lake.	22	
Lewis Brothers.	Lake Beulah.	26	17

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
WISCONSIN—continued.			
Lindsey, Geo. C.	Manawa	20	12
Luttman, Henry:			
Farm No. 1.	Watertown	24	
Farm No. 2.	do.	15	
McFarland, J. M.	do.	13	
Malloy, Harry A.	Hartford	15	
Marty, Fred. C.	Monticello	47	
Menning, Roy	Appleton	9	15
Menning, Wm.	do.	19	
Miller, A. J.	Milltown	27	1
Miller, J. C.	Pickett	18	4
Moen, Anfin K.	Stoughton	8	11
Molzahn, J. J.	Watertown	20	2
Morey, E. E.	Sheridan		17
Mullen, T. J.	Watertown	33	
Nace, F. A.	Iola	38	
Noyes, Alvin A.	Jefferson	10	1
O'Leary, Wm.	Honey Creek	34	
Olson, Chris.	Ogdensburg		13
Peterson, P. O.	do.	3	10
Pingel, John	Appleton	6	29
Pinkerton, A. J.	Waupaca	14	4
Piper, John E.	Watertown, Ebenezer Stock Farm	22	
Plummer, George	Oshkosh	6	26
Post & Pitzer, Drs.	Barron	37	
Rice, Geo. C.	Webster		16
Ruddick Farm Land Co.	Stone Lake	24	4
Schaefer, R. J.	Appleton	41	
Schaefer, Mrs. Wm.	do.	2	13
Schmidt, J. F.	Randolph	41	
Skaulen Old People's Home	Stoughton	34	
Smith, A. E.	Waupaca	24	
Smith, J. H.	do.	3	11
Sodersten, Gust	Scandinavia	1	21
Spencer, Robt.	Evansville	47	
Stauffacher, W. W.	New Glarus	26	7
Steffensen, Walter A.	Appleton	25	
Stigler, Jos. A.	Waukesha		12
Stigler, Michael	do.	2	19
Swan, Nat.	Wauwatosa	3	27
Swan, Robt. G.	do.	14	
Swoboda, Frank A.	East Troy	30	
Ten Pas Bros.	Arpin	14	22
Thomas & Thomas	Baraboo	5	28
Thome, Peter	Rice Lake	6	32
Thorson, C. P.	Scandinavia	5	9
Thorson, O. M.	do.	4	22
Tomah Indian School	Tomah	65	
Treleven, A. B.	Omro	9	11
Tristram Farm Co.	Eau Claire	32	24
Van Lone, A. E.	Jefferson	35	
Voss, J. G.	Elkhorn	31	
Waite, T. B.	Oshkosh		23
Weissenburg, Geo.	Stanley	35	
Wilton, J. C.	Eagle	37	
Wisconsin Home and Farm School	Dousman	19	
Zickert, Otto E.	Rosendale	4	10
Ziem, Chas. W.	Larsen	9	9
Total (Holstein-Friesian, United States)		11,819	11,991

JERSEY.

ALABAMA.			
Baker, P. B.	Birmingham, R. R.	1	50
Burton, T. H.	Oxford	26	5
Caldwell, Miss Daisy	Scottsboro	3	15
Calloway, Frank	Snowdon		18
Duggar, J. F. jr.	Hope Hull		56
Hagan, Mrs. Frances J.	Montgomery	3	17
Halles, A. F.	do.		41
Hall Bros.	Dothan	15	41
Hall, W. M., & Sons.	James	78	
Haynes, D. P.	Anniston	10	42
Holcomb Bros. Dairy	Birmingham, R. 4.	5	60
Jones, J. L.	Barachias		35
Moore, R. O.	Newbern	2	22
Praytor & Jenison	Trussville	29	4

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
ALABAMA—continued.			
Price, E. E.	Montgomery, R. 4.	3	36
Richardson Bros.	Montgomery.	2	60
State of Alabama.	Montgomery Stockade No. 1.		27
Do.	Speigner.		31
Do.	Wetumka.		31
Do.	Mount Vernon (Searcy Hospital).		38
Thedford, W. F.	Montgomery.	1	20
Watson, R. F., & Son.	Anniston.	6	7
Wilkinson, E. L., & Sons.	Birmingham, R. 4.		54
Wilson, Albert F.	Montgomery.		49
ARKANSAS.			
Welty, D. C.	Texarkana.	72	23
CONNECTICUT.			
Bedford, E. T.	Greens Farms.	37	
Black, R. J.	Watertown.	8	3
Foster, M. B.	West Hartland.	11	
Hcald, Daniel A.	Cheshire.	6	3
Kingsbury, John E.	Rockville.	20	3
Savage, C. H.	Storrs.	31	
Savage, W. I. & T. M.	Berlin.	31	9
Whiting, Henry M.	Merrow.	13	
FLORIDA.			
Adams, C. H.	Bartow.	1	64
Anderson, A. J.	Pensacola.	1	25
Arbor Jersey Farm; Miss M. O. Chase, manager.	Brandon.	51	2
Danson, Thos.	Jacksonville, Kings Road.		35
Donell, L. M.	Orlando.		21
Horton, C. M.	Fort Pierce.		18
Howell, Ira C.	Pensacola.		12
Lanier, A. R.	Orlando.		12
Mahoney, P. W.	Jacksonville.		15
Milam, M. A.	Miami.	62	3
Olustee Manor Farm.	Olustee.	2	27
Pennock Plantation.	Jupiter.	25	44
Southern States Land & Timber Co.	West Palm Beach.	23	40
Stover, W. S.	Dinsmore.		30
Westcott, Walter.	Orlando.		15
Winkelmann, Herman.	Jacksonville, general delivery.		49
Wilson, Milton D.	Bartow.	26	44
GEORGIA.			
Cochran, C. W.	Thomasville.	20	
Hardman, Dr. L. G.	Commerce.	91	
Hunt, B. W.	Eatonton.	26	2
IDAHO.			
Brunis, J. F.	Boise.	12	12
University of Idaho dairy herd.	Moscow.	13	
ILLINOIS.			
Bicknell, J. S.	Lovington.	18	2
Brennemann, Albert.	Hopedale.	1	6
Bridgford, C. W.	Joy.	39	22
Dering, J. K.	Lake Villa.	115	
Dewey, C. H.	Morris.	17	
Emil, Frank.	Sullivan.	10	8
Green, L. A.	Dayton.	64	
Haughey, Frank M.	McLean.	14	11
Mautz, L. P.	Watson.	35	
Moore, W. D. N.	Highland Park.	9	
Whitfield, Z. B.	Sullivan.	12	
INDIANA.			
Billger, Charles.	Goshen.	11	
Boyd, J. T.	Vincennes.	36	
Boyer, A. L.	Shelburn.	10	
Boyer, Roy L.	Columbus.	5	11
Burke, William B.	Bloomington.	5	3
Catlin, Alfred.	Elizabethtown.	2	10
Collier, E. S.	do.	22	1
Covode, Mrs. M. A.	Westfield.	30	2
Cunningham & Son, J. R.	Rising Sun.	28	19
Curry, D. N.	Carlisle.	9	8

JERSEY Continued.

Name.	Address.	Purebred cattie.	Grade cattie.
INDIANA—continued.			
Curry, H. L.	Bloomington.	16	12
Decker, Henry, jr.	Vincennes.	28	14
Donnelly, Maurice.	Carmel.	.....	11
Fyffe, R. H.	Bloomington.	6	24
Hiatt, Cleodas.	Newcastle.	5	8
Hogue, Sam.	Vincennes.	23	20
Ice, Harry H.	Mount Summit.	6	9
Jones & Son, J. C.	Pine Village.	15	.....
La Mar, Horace.	Liberty.	14	.....
McCulloch, Harold.	Charlestown.	17	.....
McNutt, Lewis.	Brazil.	13	11
Minnich, A. V.	Carlisle.	5	23
Oliphant & Kreh.	Vincennes.	1	8
Rohm, Guy.	Carbon.	10	2
Schacht, C. T. Oscar.	Bloomington.	10	1
Senour, W. H.	Brookville.	21	.....
Shaw, H. O.	Zionsville.	12	.....
Sherwin, Sol.	Middlebury.	27	.....
Shields, Zib.	Shelburn.	6	5
Smith, Wm. G.	Spiceland.	7	17
Thorn, William F.	Vincennes.	3	16
Vannice, L. G.	Amo.	23	9
Warner, A. G.	Auburn.	13	.....
Wheeler & Son, A. L.	Mooresville.	30	4
Whitford, Scott.	Kendallville.	23	.....
Wilkinson, W. D.	Noblesville.	41	.....
Winslow, L. A.	Bloomington.	23	1
IOWA.			
Barr, W. J.	Algona.	5	10
Heaton, A. S.	Fairfield.	21	1
Keener & Co.	Newton.	41	.....
Nurre, J. J.	Bancroft.	13	.....
KANSAS.			
Arnott, Marshall.	Blue Rapids.	.....	16
Coleman, C. C.	Sylvia.	37	.....
Dorn, T. F.	Topeka.	32	.....
Dudley, J. F.	Carlyle.	10	.....
Furse, E. D.	Pleasanton.	8	2
Grier, James.	Conway Springs.	18	2
Greene, R. W.	Lincoln.	12	2
Gilliland, R. A.	Mayetta.	40	.....
Hasenyager, C. A.	Bern.	1	16
Haworth, Erasmus.	Lawrence.	12	1
Krasny, Jos.	Topeka.	14	6
Knopf, Frank.	Holton.	10	.....
Leonard, Oscar E.	Lawrence.	4	16
McKee, R. O.	Marysville.	15	.....
Porter, J. B., & Sons.	Mayetta.	35	.....
Salisbury, B.	Tescott.	5	.....
Scheibeler, F.	do.	5	8
Scantlin, T. H.	Savonburg.	29	.....
Tredway & Son, J. F.	La Harpe.	15	2
Tilley, C. A.	Frankfort.	19	2
Walton, W. W.	Holton.	11	12
Wempe, Robert.	Seneca.	7	.....
Yust, Robert J.	Sylvia.	19	2
KENTUCKY.			
Burnheim, Isaac.	Anchorage.	9	.....
Bradley, P. & E.	Trenton.	.....	15
Cassady, Ed.	Crestwood.	22	.....
Cobb, Dr. R. L.	Trenton.	16	.....
Coleman, Chas. E.	Latonia.	.....	8
Dickinson, W. J.	Trenton.	11	3
Field, F. C.	Owensboro.	14	.....
Garth, J. B.	Trenton.	11	.....
Garth, Morton.	do.	8	.....
Gary, J. C., & Son.	Hopkinsville.	23	1
Hanser, Carl.	Shelbyville.	3	13
Hurstbourne Farms.	St. Matthews.	11	8
Lindsay, E. B.	Elkton.	15	.....
Mason, Jas. F.	Hopkins.	18	.....
Richardson, Luke.	Kenton.	.....	11
Rice, Henry C.	Fredonia.	.....	50
Waller, W. S.	Trenton.	12	.....
Ware, E. J.	do.	8	.....
Yager & Ellis.	La Grange.	.....	28

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
LOUISIANA.			
Allen, J. C.	Kentwood.		17
Bridges, J. M.	do.		20
Buckhalter, Ed.	Tangipahoa.		26
Diamond L. Ranch	Angie.		6
Edwards, W. D.	Tangipahoa.		21
Gavden, George L.	Gurley.	73	55
Gillette, O. R.	Houghton.	19	
Hicks, S. B.	Shreveport.		6
Hutchinson, C. T.	Tangipahoa.		30
Hutchinson, S. N.	do.		34
Hutchinson, T. S.	do.		32
McCourtney, J.	Slaughter.	1	35
Morgan, L. E.	Baton Rouge.		23
Morris, W. B.	Slaughter.		44
Mosley, R.	Stonewall.	5	21
Pesson, Louis.	New Iberia.		50
Pesson, Robert.	do.		54
Powell, J. A.	Kentwood.		16
Shaffer, J. J.	Ellendale.		59
Shaffer, R. B.	do.		7
Smith, Hon. F. K.	Shreveport.	23	
Stonewall High School.	Stonewall.	1	7
Travis, Dr. R. W.	Tangipahoa.		7
Waller, H. H.	do.	1	46
Williams, L. K.	Patterson.	25	28
MAINE.			
Adams, Wm.	Bowdoinbam.	11	
Ames, Leslie.	Waterville.	5	6
Ballard, Albert L.	Augusta.	1	9
Blanchard, George.	Cumberland Center.	33	
Brackett, Guy L.	Woodfords.	27	
Burgess, Chas. T.	Union.	31	2
Butler, Harold E.	Franklin.		11
Clement & Taylor.	Winthrop.	3	7
Cobb, C. F.	Lisbon Falls.	13	
Dean, H. A.	Lincolnville.		17
Files, E. E.	Gorham.		12
French, C. G.	Norway.		10
Griffin, Stanley R.	Levant.	10	5
Hackett, L. L.	Canton.	18	1
Haslam, Moses.	Waltham.		14
Higgins, B. W.	Levant.	10	16
Hunter, Miss Ella.	Topsham.		12
Ingraham, E. H.	Augusta.		19
Keep & Taylor.	North Jay.	17	
Leach, M. O.	West Penobscot.	8	12
Luce, Frank.	Augusta.	1	10
Luce, M. A.	Topsham.		12
McLean, J. A. & O. S.	Augusta.	4	18
Moores, Albert E.	Houlton.	27	
Mottram, Walter L.	Sabattus.	2	11
Moulton, David E.	Portland.	32	
Page, E. D.	Bangor.	20	
Pike Bros., W. W. & F. B.	Cornish.	31	
Randall, C. S.	Portland.	8	
Robbins, Maurice.	Augusta.	3	17
Smith, R. W.	East Corinth.	17	10
Walker, J. W. G.	Brownfield.	22	11
Wilder, V. E.	Washburn.	12	3
Wilson, Willard.	Cumberland Center.	8	7
Young, Wm. F.	Norway.		22
MARYLAND.			
Carcaud, J. E.	Bel Air.		15
Cockey, I. C.	Claiborne.	9	15
Cooper, P. B.	Annapolis.	2	16
Cramer, H. R.	Walkersville.		14
Greer & Thompson.	Bel Air.	65	4
Grossnickle, H. D.	Boonsboro.	37	
Hershberger, Saml.	Grantsville.	18	
Hoopes, Jos. T.	Bel Air.	22	
Jacobs, Mrs. H. B.	Baltimore, Carroll.	18	
Jewett, H. J.	Darlington.	33	
La Prot, S. W.	Annapolis.	21	
McNabb, D. Paul.	Whiteford; post office, Bel Air.	24	2
Miller, Norman.	Grantsville; post office, Elk Lick, Pa.		11
Monks, Thos. J.	Bel Air.		14
Nicodemus, C. A.	Walkersville.	2	13
Powell, A. T.	Brookville.	8	1

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MARYLAND—continued.			
Pyle, Geo. M.	Bel Air, R. 3.		10
Saul, B. F.	Kensington.	8	
Stonebraker, J. E.	Hagerstown.	25	
Walker, N. Walter	Colesville.		20
Yoder, C. J.	Grantsville.		10
Yoder, John U.	Grantsville; post office, Elk Lick, Pa.	6	12
Yoder, Simon M.	do.		12
MASSACHUSETTS.			
Brewer, Miss F. R.	Nantasket Junction.	27	
Davis, George E.	Becket.	16	
Nye, T. H.	Chicopee.	20	2
Schermerhorn Estate, F. A.	Lenox.	28	
Slater Estate, Wm. S.	do.	25	
Walker Estate, W. H.	Great Barrington.	21	4
MICHIGAN.			
Balden, Alvin.	Capac.	36	
Brennan, Fitzgerald & Sinks.	Farmington.	28	
Conyer, Dr. C. B.	Kalamazoo.	10	7
Mumford, H. W.	Ann Arbor.	46	
Probert, H. F.	Jackson.	71	
Stevenson, Jas., & Son.	Washington.	33	
Taggett, C. A.	Fairgrove.	12	
Wedge, J. D.	Allegan.	20	
MINNESOTA.			
Aldrich, H. G.	Mora.		15
Brackett, C. R.	Long Lake.	33	1
Cliff, M. T.	Lake City.	17	
Elliott, H. L.	Minneapolis.	14	9
Glenzke, Clayton.	Hopkins.	4	7
Grathwol, J. J.	Excelsior.	18	
Hanna, L. B.	Austin.	23	
Head, Dr. M. L.	Albert Lea.	46	
Johnson & Son, Fred.	Plainview.	15	35
Lagerson, O. C.	Anoka.	11	7
Love, J. W.	Wayzata.	10	
Lymburner, Robt. H.	Osage.	33	
Morck, C. J.	Kenyon.	15	7
Munn, M. D.	Forest Lake.	80	
Munson Bros.	Hartland.	48	
Palmer, E. G.	Elk River.	2	21
Patchen, W. H.	Anoka.	9	5
Reed & Son, F. H.	Racine.	6	26
Saunders, E. N., jr.	St. Paul.	31	10
Schneider, Chas. A.	Albert Lea.	16	8
Slade, G. T.	White Bear.	10	
Webber, C. C.	Minneapolis.	20	
Wood, J. R.	Austin.	16	3
MISSISSIPPI.			
Mech. College.	Starkville.	118	16
Baptist Orphanage.	Jackson.		23
Bowen, N. M.	Byhalia.	11	2
Bush, C. H.	Laurel.	1	31
Cooper, J. J.	Dixon, R. 1.	11	16
Evans, J. E.	Muldon.	46	
Grenada College.	Grenada.	1	6
Gurlier & Meeks.	Macon.	6	111
Gurlier & Moorehead.	Brooksville.	38	24
Gurlier, H. B., & Co.	Macon.	39	205
Hardage, T. M.	Dixon.	10	8
Hawkins, Mrs. A. L.	Jackson.	2	28
Hayes, W. T.	Dixon.	5	4
Henley, J. W.	Jackson.		22
Houston, C. L.	Laurel.		34
Humphries, T. S.	Durant.	46	21
Lewis, Ed.	Dixon.		17
Lewis, Ira.	do.	2	7
Lotterhos, J. L.	Crystal Springs.	4	44
Majure, C. C.	Dixon.	3	2
Majure, Dewitt.	do.	12	7
Majure, J. C.	do.	14	4
Majure, R. L.	do.	5	1
Majure, Roy.	Dixon, R. 1.	5	8
Majure, W. A.	Dixon.	9	6
Majure, W. J.	do.	5	10
Majure, W. W.	do.	4	6

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MISSISSIPPI—continued.			
Matthews, J. C.	Jackson	64	—
May, J. M.	Brookhaven	4	27
Middleton, H. F.	do.	17	44
Mississippi Deaf and Dumb Institute.	Jackson	—	28
Moore, E. V.	Laurel	4	11
Moore & Co., J. S.	Starkville	39	35
Price, W. E.	Clinton	—	22
Provine, Dr. J. W., & Williams, G. H.	do.	—	23
Russel, J. T.	Laurel	3	3
Scates, E. D.	Brooksville	14	—
Simmons Stock Farm	Edwards	10	46
Smith, L. S.	Clinton	—	21
Snider, J. R.	West Point	—	37
Stribbling, Sog.	Dixon	4	6
Tanner, C. J.	Jackson	—	32
Thomas, Jim H.	Dixon	5	—
Turner, F. J.	do.	8	17
Turner, J. M.	do.	19	1
Ward, C. D.	Terry	1	42
Watson, Asa	Strong	38	3
West, W. Z.	Vassburg	7	9
Wood, W. K. & W. L.	Brookhaven	37	—
MISSOURI.			
Busen, Chas. L.	Eureka	37	—
Emmans Asylum.	St. Charles	1	10
Landrum, C. W.	Reeds	18	4
MONTANA.			
Montana State College	Bozeman	15	5
NEBRASKA.			
Becker, R. W.	David City	5	—
Carter, C. B.	Hebron	7	—
Yost, C. E.	Hastings	37	6
NEVADA.			
Reilly, D. W.	Reno, R. 1, box 70.	5	12
NEW HAMPSHIRE.			
Chapman, H. Ryerson	Concord	14	—
Chellis & Son, Rush	Claremont	32	1
Guerin, E. R.	Hopkinton	11	—
Smith, Frank	Lakeport	35	—
NEW JERSEY.			
Abbott, George S.	Salem	15	—
Albright, Andrew	Maplewood	24	—
Dryden, Forrest F.	Bernardsville	12	—
New Jersey Agricultural Experiment Station.	New Brunswick	73	—
Taylor, Knox	High Bridge	9	—
Young, Henry F.	Bernardsville	32	—
NEW YORK.			
Babcock, Elias	Schoharie	13	1
Billings, Mrs. H. B.	Valcour	34	—
Butler, Edmond	Mount Kisco	53	—
Conklin, Irvin	Downsville	9	42
Hunt, C. I., & Son	Hunt	14	—
Proctor, William Ross	Barryville	132	—
Smiley, Daniel	Mohonk Lake	—	29
Stone, A. J.	Nunda	8	—
Ward, Walter E.	Albany	21	15
NORTH CAROLINA.			
Albright, F. P.	Greensboro	4	10
Baker, A. L.	Newton	—	7
Cherokee Indian School	Cherokee	—	20
Cline, D. M.	Lincolnton, R. 2	6	19
Coble, S. E., Sunny Hill Farm	Guilford College	—	27
Collier, T. M.	East Durham, R. 3	—	16
Crutchfield, C. M.	Durham	—	31

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
NORTH CAROLINA—continued.			
Curtis, A. W.	Greensboro.		33
Diggs, J. F.	Rockingham	96	7
Edwards, D. M.	Raleigh, R. 6.		15
Edwards, R. L.	Guilford		27
Fisher & Morrison.	Salisbury	1	35
Green, C. J.	Raleigh		21
Griffin, R. H.	do		15
Hall, J. S., & Sons.	Barber	5	54
Harris Dairy.	Raleigh		27
Harris, W. B.	Moorestville.	8	9
Holding, H. R.	Raleigh		20
Kaplan, A. I.	do		80
Kiser, W. C.	Reepsville	3	12
Lutz, H. P.	Newton	12	15
Lutz, J. O.	do	19	1
Lutz, W. R.	do	16	1
Lynn, R. E.	Durham, R. 6.		13
Moriarity, J. D.	West Durham, R. 1.		17
North Carolina Sanatorium.	Sanatorium	17	21
Oliver, J. H.	Greensboro.		18
Pender Test Farm.	Willard	40	
Peterson, Jasper	Greensboro.		10
Pope, M. T.	Raleigh		21
Pumpelly, Raphael.	Samarcand.		43
Ramseur, D. W.	Greensboro, R. 1.		12
Reed, J. A.	Biltmore		15
Roberts, Bob.	Raleigh, R. 6.		14
Roberts, H. M.	Fletcher	13	3
Rockett, L. E.	Randleman, R. 1.	4	7
Leitz, L. H.	Newton, R. 4.	3	6
Sharpe, A. E.	Greensboro.		13
Smith, L. M.	Raleigh, R. 2.	5	2
Smith, Y. E.	East Durham		24
Smythe, A. T.	East Flat Rock.	7	2
State Penitentiary.	Raleigh		10
Tallassee Power Co.	Badin.	12	51
Walters, Mrs. B. W.	Raleigh		15
Ward, F. A.	Durham, R. 1.		17
Weatherly, A. C.	Gorman		15
Wilkerson, F. A.	Biltmore		11
Woodleif, W. C.	Raleigh		17
Wosley, J. T.	Winston-Salem		12
Worth, E. W.	Raleigh, R. 2.	15	20
Yates, R. E. L.	Raleigh		52
NORTH DAKOTA.			
Byron, Belt.	Wheatland.	14	
Crabbe, Sam F.	Fargo	66	11
Currie, S.	Park River	58	
Agricultural College.	Agricultural College.	17	3
OHIO.			
Abbott, A. G.	Wadsworth	14	
Baker, W. H.	Salem	1	9
Beman & Son, M. E.	Thurman	35	
Blackburn, I. Robert.	Dayton	35	
Bonnell, Hugh W.	Youngstown	73	
Brantingham, J. & J. C.	Winona	60	
Bundy, D. C.	Barnesville	5	
Childlaw, E. H.	Cleves.		19
Cope, Seward B.	Winona	18	1
Cope, William L.	Salem	5	2
Creagor, James W.	Tiffin	11	2
Dumford & Son, I. N.	Newtownsville.	12	
Edgerton, W. G.	Hanoverton.	12	
Frederick, R. E.	Poland.	21	
Gemberling, E. E.	Kent.	8	
Kahler, F. J.	Plain City	57	
King, Oliver E.	Tiffin	2	11
Miller & Sons, J. S.	Ellsworth.	37	
Murphy, A. W.	Chardon.	45	
Pottarf, Jesse C.	Salem	11	
Read & Hall.	New Waterford.	27	
Rinehart, W. E.	Magnolia.	24	
Schoepf, W. K.	Glendale.	53	
Shepherd, W. C.	Hamilton	11	
White, Jacob E.	Greenfield.	215	

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
OREGON.			
Altman, B. C.	Gresham	6	
Biersdorf, George	Cornelius	25	
Cary, Ed.	Carlton	40	
Conner, George & Ella	Albany	26	
Dickson, J. M., & Sons	Shedd	46	
Doerfler, F. A.	Silverton	17	
Ewalt, Lucy	Aurora	24	
Haley, Lester B.	Hillsboro	24	
Hewitt, G. G.	Monmouth	29	
Johanson, C. H.	Gresham	19	
Ladd, William M.	Portland	57	
Loughary, Frank	Monmouth	16	
Lynn, F. E.	Perrydale	34	
McArthur & Stauff	Rickerall	35	
Reith, J. W.	Astoria	6	21
Smith, Emery T., & Son	Myrtle Creek	12	
Williams, Thomas	Forest Grove	10	21
Withycombe, George H.	Gaston	24	
PENNSYLVANIA.			
Allen, G. G.	Grove City, R. 11		15
August, J. C.	Diamond	1	14
Badger, A. G.	Slippery Rock, R. 1	15	2
Badger, L. A.	Slippery Rock, R. 4	8	3
Baker, C. L.	Mercer, R. 6		15
Baker, Jay D.	Grove City, R. 16	8	1
Barnes, E. G.	do.	17	
Barron, J. R.	Grove City, R. 13	7	5
Birchard, S. C.	Birchardville, R. 1	33	
Black, A. S.	Grove City, R. 16	16	
Campbell, W. A.	Jackson Center	6	3
Carter, Luke B.	Titusville, Oakwood Farm	25	2
Church, G. W.	Townville, Fairmead Farm	13	2
Chase, L. W.	Centerville	6	10
Cooper, F. J.	Slippery Rock, R. 2	5	9
Cooper, Thomas	Euclid, R. 2, Sycamore Crest Farm	17	8
Cummings, R. K.	Grove City, R. 16	11	5
Davidson, C. M.	Jackson Center, R. R., Hill View Farm	6	7
Davis, W. H.	Slippery Rock, R. 2	36	
Foster, Manville, & Son	Volant, R. 1	4	18
Fullerton, A. H.	Edinburg, R. 2, Fruitlands Farm	28	
Gallatin, Quinn	Enon Valley, R. 2	6	13
Gerlach Bros.	Slippery Rock	12	28
Giebner, C. E.	Jackson Center, R. 19	5	7
Gill, Charles	Slippery Rock, R. 5	1	11
Gillam, W. D.	Mercer, R. 6	4	11
Gregg, H. H., & Ivan	Grove City, R. 11		10
Haning, W. E.	Elk Lick, R. 1		16
Helm, Mrs. P. H.	Jackson Center	9	3
Hodgson, Joseph	Grove City, R. 16		11
Hoopes, Price, & Son	Norristown, R. 2, Springdale Farm	13	2
Hummer, Jos. C.	Titusville, R. 2, Spring Hill Dairy Farm	12	9
Humphrey, J. Roy	Slippery Rock, R. 2	9	4
Humphrey, S. C.	Slippery Rock, R. 2, Pleasant Hill Farm	11	8
Humphrey, W. H.	Grove City, R. 14	10	5
Do.	Portersville, R. 2	23	
Kerr, Friend E.	Titusville, R. 2, Valley Ridge Farm	7	8
Long, W. H.	Grove City, R. 16	10	1
Luce, R. W., & L. L.	Guys Mills, Grand Spring Farm	2	10
McCleary, F. J.	Slippery Rock, R. 3	2	11
McClellan, E. J.	Jackson Center, R. 18		12
McCommon, H. B.	Volant, R. 2		12
McCracken, Lee	Slippery Rock, R. 3	6	7
McGurley, H. L.	Enon Valley, R. 2	17	1
McGurley, W. B.	New Middletown, Ohio	5	14
McDougall, T. J., & Son	Grove City, R. 14, Lone Ash Farm	6	12
McDowell, J. G.	Grove City, R. 16	4	12
McEwen, W. H., & John	Mercer, R. 2	7	13
Martin, J. W., & Sons	Edinburg, Alberta Stock Farm	35	
Menhorn, Elmer G.	Elk Lick, R. 1		10
Miller, J. F.	Edinburg, R. 2	3	14
Miller, W. C.	Grove City, R. 16	1	14
Minner, Frank L.	Pulaski, R. 62	5	5
Pennsylvania State College	State College	11	
Perrine, Roy E.	Jackson Center, R. 18	1	18
Perschke, E. F., & Son	New Castle, R. 6, Chestnut Ridge Jersey Farm	18	
Reed, H. R.	Slippery Rock, R. 5		13
Rouse, Thomas, & Son	Mercer, R. 6	5	5
Seth, G. H.	Grove City, R. 13	7	11

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
Shriver, R. H.	Diamond	3	10
Stephens, W. J.	Titusville	2	17
Studebaker, J. W.	Slippery Rock, R. 2	10	15
Tait, F. B.	Mercer, R. 6	10	3
Tait, J. W.	Mercer, R. 5	11	1
Todd, A. J.	Grove City, R. 16	2	10
Uber, J. N.	Mercer, R. 6	3	11
Wallace, J. Clifford	Edinburg, R. 2	3	14
Weinel, J. H., & Sons	Mercer, R. 5	2	10
Williamson Free Trade School	Williamson School	42	2
Wimer, F. W.	Portersville, R. 2	5	9
Yoder, Menno J.	Meyersdale, R. 2	7	21
Zillfro, A. W.	Portersville, R. 2	15	
RHODE ISLAND.			
Van Bueren, M. M.	Aquidneck	4	1
SOUTH CAROLINA.			
Agnew, S. W.	Callison		19
Allison, F. L.	Beaufort		30
Bowden, J. H.	Sandy Springs	23	87
Crum, Mrs. Nora	Denmark		37
Gray, D. P.	Williamston	5	44
Harris, B.	Pendleton	23	10
Hertz, J. A.	Charleston		43
Leitner, F. W.	Columbia		14
Mary Mede Dairy Farm	Summerville		35
Morrah, S. P.	Willington, R. R		14
Myers, J. B.	Summerville		33
Rodgers, L. M.	Ridgeville		25
Shanklin, J. A.	Camden	138	
Smith, J. L.	Spartanburg		21
State Hospital for Insane, State Park	Columbia		15
TENNESSEE.			
Appleby, S. C.	Pulaski	84	1
Bolton, D. F., & Sons	Limestone	16	6
Camp, H. N.	Knoxville	42	
Brown, Percy	Spring Hill	20	36
Campbell, L. R.	Nashville	10	50
Campbell, Geo.	Spring Hill	46	1
Callahan, Geo. W.	Knoxville	72	6
Cooper, J. L.	Nashville	31	
English, H. K.	Pulaski	6	
Fort, Dr. R. E.	Nashville	52	25
Gettys, Mrs. W.	Athens	32	2
Griffin, Dr. R. W.	Tiptonville	7	
Griswold, W. A.	Nashville	53	12
Haynes, C. N.	Murfreesboro	27	
Johnson, A. C.	do	19	
Johnson, J. O.	Brownsville	27	
Kingswood Farm	Murfreesboro	101	
Middle Tennessee State Normal	do		27
Overton, J. M.	Nashville	60	4
Patterson, R. W.	Caney Springs	5	22
Polk, H. M.	Spring Hill	15	
Sanders, R. J., & Son	Pulaski	98	5
State Training and Agricultural School	Nashville	9	44
Stoner, M. C.	Jefferson City	17	
University of Tennessee	Knoxville	35	
Woods, W. H.	Murfreesboro	5	5
UTAH.			
Boulton, Alfred	Woods Cross	12	
Caine, John T.	Richmond	56	
Cleverly, Fred	Woods Cross		18
DeMott, Bergon	Kaysville		15
Hillam, L. W.	Salt Lake City	4	5
Mount Ogden Stock Farm	Ogden	42	1
Nuttall, Wm. A.	Provo	13	6
Price, Wm. V.	do	54	40
Rich, Otto	Salt Lake City		8
Rouse, Frank Y.	Springville	45	
Smoot, O. A.	Provo	4	
Utah Agricultural College	Logan	16	
Utah State School for Deaf and Blind	Ogden	13	2
Utah State Industrial School	do	49	
Utah State Mental Hospital	Provo	90	31
Winder, W. C.	Salt Lake City	43	

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
UTAH—continued.			
Wasatch Farms Co. (formerly Smith Bros.).	Murray.....	75	.....
White, Roy.....	Farmington.....	12	3
VERMONT.			
Adams, W. E.....	Hartland.....		8
Bicknell, E. O.....	Tunbridge.....	10	4
Courtemanche, W. H.....	White River Junction.....	10	16
Cox, Elmer F.....	East Thetford.....	17	.....
Daniels, Bert. W.....	Middlesex.....		28
Darling, George W.....	Groton.....	12	12
Dinsmore, A. H.....	St. Johnsbury.....	2	2
French, P. S.....	Johnson.....	21	2
Gale, E. B., & Son.....	Stowe.....	38	4
Goss, F. A.....	West Danville.....		50
Graham, Miss Isabel S.....	Craftsbury.....	20	1
Graves, W. J.....	Waitsfield.....	6	32
Green, J. C.....	East Bethel.....	32	.....
Harvey, G. W.....	Taftsville.....		15
Hatch, Frank.....	Craftsbury.....		14
Holmes, H. R.....	Johnson.....	25	2
Hopkins, R. E.....	Cabot.....	57	.....
Houston, Ernest M.....	Stowe.....	39	.....
Jones, E. H.....	Waitsfield.....	18	44
Kimball, Mrs. E. M.....	Enosburg Falls.....	26	16
Lenton, J. J.....	Passumpsic.....	32	.....
Morrison, J. C.....	West Barnet.....	2	27
Nichols, G. L.....	Enosburg Falls.....	77	.....
Perley, Theo. W.....	do.....	51	4
Richards, C. M.....	Kirby.....		16
Rogers, H. H.....	Royalton.....	2	22
Smith, Arthur M.....	East Bethel.....		21
Smith, D. M.....	Lyndonville.....	10	8
State School of Agriculture.....	Randolph Center.....	22	8
Tiffany & Royce.....	East Berkshire.....	117	2
Vondle, P. C.....	Stowe.....	13	16
Wilcox, Clyde.....	Cambridge.....	4	9
VIRGINIA.			
Andes, W. J.....	Beauleton.....		21
Andrews, J. S.....	Orange.....	37	2
Atkinson, Thos.....	Gordonsville.....	5	36
Baldwin, F. C.....	Fredericksburg.....	49	.....
Ballou, F. N.....	Herndon.....		11
Barksdale, A. S., & Son.....	Randolph.....	1	23
Barksdale, Flourney.....	do.....		28
Barringer, P. B.....	Charlottesville.....		22
Bass, C. M.....	Rice.....		18
Batterman, August.....	Chatham.....		16
Beachy, N. C.....	Norfolk, R. 5.....		12
Berry, A. M.....	Mitchells.....	3	14
Blanton, J. R.....	McDuff.....	5	17
Boleck, H. A.....	Charlottesville.....		16
Bradbury, W. L.....	Orange.....	14	.....
Brown, W. C.....	Lincoln.....	1	15
Bruce, J. T.....	Rice.....		30
Brumback, H. W.....	McLean.....	4	12
Calhoun, S. A.....	Ivy.....		30
Cawley, J. J.....	South Richmond, R. 8.....		14
Clark, C. F.....	Waynesboro.....		20
Curl, Mrs. Virginia.....	Lincoln.....		10
Damewood, J. W.....	Catawba.....	7	6
Darlington, J. J.....	Herndon.....	12	12
DePauw, Mrs. N. T.....	Haymarket.....	5	83
Gates, W. B.....	Rice.....	42	.....
Glover, Jas. D.....	Staunton.....	1	27
Gray, Eggleston.....	Calverton.....		23
Groom, H. C.....	Warrenton.....	13	.....
Hahn, E. D.....	Denbigh.....		13
Haight, H. C.....	Fairfax.....		21
Hall, Wm. T.....	Round Hill.....	21	12
Hibbert, R. B.....	Charlottesville.....		18
Hill Crest Farm.....	Falls Church.....	11	1
Hook, A. L.....	Staunton.....	52	.....
Houston, W. G.....	Fairfield.....	14	19
Hurst, J. T.....	Vienna.....		14
Hyde, H. W.....	Clearbrook.....		20
Johns, A. A.....	Farmville, R. 4.....		21
Johns, Monroe.....	Farmville.....		33
Johnson, J. B.....	Manassas.....	24	12
Jones, C. A.....	Fredericksburg.....		22
Lee, R. H.....	Hampton.....	4	1

JERSEY—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
VIRGINIA—continued.			
McGhee & Vance.....	Fredericksburg.....	22	.....
McGrady, Ennis.....	Hollins.....	10	.....
McLearn, A. O.....	Catlett.....	.....	11
Mann, E. E.....	Ryan.....	2	11
Morrisetti, J. T., & Son.....	Rice.....	1	14
Newman, Mrs. Rosa.....	Sterling.....	.....	20
Orrock, E. M.....	Fredericksburg.....	2	13
Payne, S. B.....	Remington.....	.....	17
Peterson, J. N.....	Norfolk, R. 2.....	.....	16
Redd, S. R.....	Hanover.....	11	28
Rhodes, R. L.....	Hampton.....	.....	11
Robinson, Samuel.....	Midland.....	.....	11
Roller, D. F.....	Timterville.....	21	2
Roller, J. S.....	do.....	16	1
Rowe, M. B.....	Fredericksburg.....	55	8
St. Albans Sanatorium.....	Radford.....	7	8
St. Paul Normal and Industrial School.....	Lawrenceville.....	.....	10
Shuler, Mrs. Alice.....	Motley.....	15	1
Smith, G. W.....	Rice.....	5	26
Southall, E. V.....	Jetersville.....	.....	35
Southall, J. W.....	do.....	.....	2
Swartzentruber, C. J.....	Norfolk, R. 2.....	5	5
Thomas, W. W.....	Falls Church.....	22	1
Vance, R. C.....	Fredericksburg.....	54	.....
Vaughn, J. B.....	Keysville.....	5	99
Vaughn, W. L., & Son.....	Rice.....	.....	23
Virginia Polytechnic Institute.....	Blacksburg.....	29	.....
White, C. D.....	Newport News.....	.....	25
White, S. G., & Bro.....	Harpers Home.....	.....	32
Winston, H. C.....	Lynch Station.....	4	21
Woodruff, J. J.....	Somerset.....	22	21
Woodruff, T. N.....	Fairfax.....	22	27
Yoder, N. E.....	Norfolk.....	.....	13
Yoder, W. S.....	Lynnhaven.....	.....	13
WASHINGTON.			
Carlyon, E. G.....	Bellingham.....	13	.....
WEST VIRGINIA.			
Alderson, R. D.....	Fort Springs.....	7	17
Conklyn, E. D.....	Charles Town, R. R.....	7	16
Garrison, A. B.....	West Alexander, Pa., R. R.....	1	28
Garison, H. C.....	do.....	10	8
Klug, Louis.....	Triadelphia.....	1	11
McDonald Bros.....	Charles Town.....	2	42
Moss Bros.....	Elm Grove.....	1	11
Nickison, W. H.....	Wheeling, R. R.....	.....	18
Schmidt, Woodward.....	Wheeling, R. 2.....	.....	12
Supler, John M.....	Triadelphia.....	.....	11
Swisher, G. W.....	Lost Creek.....	4	4
WISCONSIN.			
Ash, F. D.....	Roberts.....	6	16
Ausman, Geo.....	Elk Mound.....	13	20
Ausman, S. A. B.....	do.....	10	17
Bedell, E. S.....	Manitowoc.....	15	.....
Brigham, C. I.....	Blue Mounds.....	5	25
Chelmo, L. S.....	Webster.....	.....	15
Dodson, John S.....	Siren.....	9	.....
Duffy, A. J.....	Webster.....	15	1
Emerson, M., & Son.....	Wheeler.....	29	.....
Emery, J. Q., & Son.....	Edgerton.....	52	.....
Engelbreton, Ed. C.....	Webster.....	.....	15
Ihrig, J. J.....	Oshkosh.....	14	.....
Jscobs, E. C.....	Elk Mound.....	43	20
Knight, W. M.....	Eagle.....	37	.....
Lawson, Victor.....	Green Lake, Loan Tree Farm.....	35	.....
McGilvra, Ed. A.....	Baraboo.....	27	.....
Peterson, Aug.....	Orange.....	8	6
Peterson, Chas. W.....	Darlington.....	26	4
Peterson, J. E.....	Webster.....	16	17
Remington, Carl C.....	Mauston.....	13	2
Ross, Geo.....	Oshkosh.....	14	4
Scribner, Roy.....	Rosendale.....	14	.....
Tunks, E. A.....	Weyauwega.....	.....	11
Underwood, F. D.....	Wauwatosa.....	61	.....
Vandervort, Rollie.....	Tonah.....	20	.....
Wells, H. H.....	Mauston.....	3	30
Total (Jersey, United States).....		10,954	8,768

RED POLLED.

Name.	Address.	Purebred cattle.	Grade cattle.
ILLINOIS.			
Kestel, Joseph.....	Manhattan.....	16	.....
Lichtenwalter, O. L.....	do.....	16	.....
Miller, Fred. H.....	Maxwell.....	16	1
INDIANA.			
Cook, C. A.....	Decatur.....	6	7
Mann, H. W.....	do.....	15	5
IOWA.			
Danforth, W. B.....	Little Cedar.....	16	.....
Tracy & Warye.....	Nashua.....	34	3
MINNESOTA.			
Aultfather, J. H.....	Austin.....	32	.....
Foot, F. W.....	Red Wing.....	36	.....
Hansen, George.....	Arco.....	14	3
Johansen, John.....	Tyler.....	33	.....
Jost, F. V.....	Emmons.....	30	.....
Kierk, Jens.....	Thief River Falls.....	1	14
Metcalf, J. L.....	Little Falls.....	13	.....
Neuman, O. C.....	Wheaton.....	17	1
Sprandell Bros.....	Little Falls.....	11	.....
Stearns, I. E., & Son.....	Detroit.....	15	.....
Thornodson, Theo.....	Hanska.....	26	.....
Vasa Orphans Home.....	Vasa.....	4	18
MISSISSIPPI.			
Gould, L. H.....	Crawford.....	7	2
MISSOURI.			
Schwab, W. F.....	Fulton.....	34	.....
MONTANA.			
Decker, Fred. R.....	Dooley.....	31	.....
NEBRASKA.			
Dady, P. M.....	Mason City.....	20	1
Graft, Charles & Chester.....	Bancroft.....	47	.....
Haussler, Geo., & Son.....	Holbrook.....	38	.....
Mitchell, F. A.....	Hooper.....	22	.....
Pilgrim, R. D.....	Bancroft.....	13	.....
Schneller, D. R.....	Verona.....	15	.....
Thornburg, J. D., & Sons.....	Beatrice.....	11	11
Thornburg, F. V.....	do.....	11	.....
Wiles, Luke L.....	Plattsmouth.....	62	.....
NORTH CAROLINA.			
Faust, I. H.....	Ramseur.....	10	4
NORTH DAKOTA.			
Arduser, John C.....	Marion.....	44	.....
Broske, H. J.....	Pekin.....	8	4
Danforth, Harry G.....	Reeder.....	8	7
Geir, Chris.....	Edinburg.....	13	12
Hollekin, L. E.....	Palermo.....	15	.....
Olafson, J. K.....	Gardar.....	3	8
Olafson, O. K.....	Edinburg.....	11	19
Tangen, A. P.....	Pekin.....	13	4
Wood, L. A.....	Luverne.....	87	.....
OHIO.			
Nelson, Frank.....	London.....	58	.....
Price, Homer, C.....	Newark.....	25	.....
Stump, F. P.....	Convoy.....	27	.....
OREGON.			
Porter, Frank.....	Halsey.....	34	9
VIRGINIA.			
Craddock, E. B.....	Cluster Springs.....	64	.....
WISCONSIN.			
Ahlers, J. B., & Son.....	West Bend.....	28	.....
McClary, Will.....	Muscoda.....	22	.....
Martin, J. W., & Son.....	Gotham.....	18	20
Underwood, L. C.....	Avoca.....	31	.....
Wall, F. A.....	Weyauwega.....	8	2
Total (Red Polled, United States).....		1,189	155

SHORTHORN.

Name.	Address.	Purebred cattle.	Grade cattle.
ALABAMA.			
Ellsbury, W. E.	Montgomery, R. 4.	4	26
Mastin, Dr. T. L.	Huntsville.	30	
ARKANSAS.			
Ferguson, D. W.	Fayetteville.	7	3
Putnam & Son, J. M.	Pea Ridge.	9	
Roberts, L. E.	Fayetteville.	10	2
GEORGIA.			
Roddenberry, W. B.	Cairo.	16	12
ILLINOIS.			
Brown, C. C., & Son.	Heyworth.	8	2
Fisher, R. U.	Dakota.	27	
Goble, P. W.	Kansas.	31	4
Hinshaw, D. C.	Ridge Farm.	9	2
Lamm, Robt. W.	Freeport.	27	
McAdams, Carlin.	Kansas.	17	3
McClure, Geo.	Heyworth.	15	5
Morrow, W. C.	Knoxville.	13	
Ogle, Wm.	Paris.	5	13
Purkey Bros.	Heyworth.	11	2
Quinton, John.	do.	9	3
Shoemaker, Arthur.	Dakota.	9	2
Slater, G. A.	Polo.	16	14
Wernicke, Henry L.	Lena.	24	5
White, Frank.	Redmon.	11	2
INDIANA.			
Bertrand, Benoit.	Oxford.	5	3
Boyll, Posey.	Terre Haute.	5	16
Brown, Robert.	Talbot.	7	3
Dellinger, Sam.	Vincennes.	13	1
Eikenberry, J. W.	Bringinghurst.	8	2
Ewing, Wm. L.	Vincennes.	5	4
Hickman, Bert.	La Fayette.	6	2
Jones, J. Clement.	Pine Village.	30	10
Jones & Fryback.	Warren.	26	3
Kearns, W. B.	Flora.	20	2
Kerlin & Snoeberger.	Rockfield.	19	
Lane, B. W.	Delphi.	5	
McCabe, John, & Sons.	Rockville.	17	3
McCall, J. Austin.	Plainville.	1	18
Malbury, S. C.	Romney.	13	
Martin Bros.	Delphi.	31	2
Martindale & Young.	Wilkinson.	11	3
Newell, Ernest.	Delphi.		11
Paulus, Henry.	Rensselaer.	4	7
Pittman, Allison.	Farmersburg.	6	2
Porter, James.	New Ross.	1	19
Ruble, John C.	Vincennes.	13	9
Ruble & Son, W. E.	do.	28	5
Ryan, Michael A.	Montgomery.	11	1
Seiber, Charles V.	Delphi.	15	
Shoff, J. Frank.	Flora.	6	6
Shoff, Ross E.	do.	5	5
Stembel, Walter.	Oxford.	12	
Thompson, N. O.	Flora.	14	1
Thompson, James.	do.	35	
Walters, S. E.	Sullivan.	15	1
Wood, W. C.	Pendleton.	34	
IOWA.			
Clampitt, F. T.	New Providence.	42	
Engel, A. C.	Rockwell City.	13	3
Harris, I. J.	Kirkman.	33	4
Hovey, Peter.	Cresco.	77	1
Huesselman, W. G.	Orchard.	10	
Johnson, Carl O.	do.	15	14
McElroy, Edward C.	Newton.	18	7
Reese, J. L.	New Providence.	34	7
Rustad, Oscar R.	Northwood.	53	
Scholes, R. E., & Son.	Newton.	31	9
Witt, Albert.	Reinbeck.	12	4
KANSAS.			
Babbitt, C. A.	Willis.	7	23
Dolan, T. F.	Salina, R. 3.	15	
Louthian Bros.	Huron.	22	16
Miller, John Q. A.	Muscotah.	15	5
Overfield, Boyd.	Hiawatha.	31	
Poland, Milton.	Sabetha.	23	10

SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
KANSAS—continued.			
Price, D. N.	Baileyville, R. 3	20	2
Regier, John	Whitewater	23	2
Sands, T. J.	Robinson	46	3
Scholz Bros.	Huron	35	4
Taylor, E. E.	Hiawatha	25	2
Wempe, C. H.	Seneca	26	14
KENTUCKY.			
Ammerman, A.	Cynthiana	28	—
Booker, Owen	Eminence	23	4
Burnett, C. N.	Fulton	9	3
Collins, Jas. B.	Keene	14	7
Jackson, Pete	Fulton	9	11
Johnson, O. M.	Millersburg	11	3
Kendall, Mrs. M. F.	Bardwell	7	6
Marshall, Mrs. E. D.	Sterling	20	10
Redmon, J. P.	Paris	22	3
Richardson, Kirby	Kenton	9	5
Wharton, Geo.	Springfield	30	1
Woodruff, Geo.	Louisville	16	2
LOUISIANA.			
Hicks, S. B.	Shreveport	17	2
MAINE.			
Faught, F. W.	Augusta	9	4
Lynnburner, Eugene B.	North Brooksville	—	17
Millett Bros.	Norway	5	11
MARYLAND.			
Beachy, E. J.	Grantsville	4	17
Beachy, J. A.	do.	4	15
Crain, Robert	Mount Victoria	131	7
Frere, Wm. J.	Tompkinsville	9	7
Gordon, Mrs. A.	South River	—	15
Kuykendall, D. F.	Grantsville	14	2
Yoder, Ezra M.	Grantsville; post office, Elk Lick, Pa.	—	17
Yost, Peter H.	Grantsville	10	3
MICHIGAN.			
Anderson, Floyd J.	St. Johns	15	3
De Garmo, A. D.	Highland	15	—
Martin, Jno.	Corunna	6	14
Schmidt, Jno.	Reed City	36	—
Tuttle & Annis	Leslie	25	—
MINNESOTA.			
Anderson, A. J.	Villard	29	6
Anderson, Alex P.	Red Wing	18	16
Baker, Geo. J.	Farmington	37	—
Baker, R. E.	Detroit	15	3
Bandas, Edw.	Biscay	22	—
Bauer, Herman	Faribault	9	5
Beadell, A. E.	Lansing	17	2
Beebe, N. E.	St. Hilaire	1	29
Bice Bros.	Faribault	1	15
Blaska, Henry	St. Hilaire	—	10
Bonniwell, H. H.	Hutchinson	21	—
Brinkman, Ferdinand	Glencoe	—	11
Broderick, M. J.	Garvin	5	22
Bundy, O. S.	Winona	—	30
Byhoffer, Harry	Buffalo Lake	10	5
Byhoffer, Roy	do.	15	—
Byhoffer, Theo	do.	6	12
Carnel, F., & Sons.	Cannon Falls	17	—
Chadwick & Lawson	Racine	5	8
Chamberlain, Geo. H.	Mora	43	—
Christopherson & Harley	Clarks Grove	2	17
Clarke, Josh. B.	Mora	41	1
Cooper, N. W.	Spring Valley	19	8
Coyle, Albert	Thief River Falls	—	14
Crandall & Danforth	Northfield	48	4
Crowley, J. F.	Chatfield	36	2
Crowley, Nick	do.	29	4
Dady, J. J.	Kellogg	48	5
Denhart, J. W.	Hazel	16	—
Deters, W. F.	Caledonia	41	—
Devaney, T.	Waverly	11	22
Dock, William	Stanton	18	2
Drews, J. E.	Mapleton	40	—
Ehlers, Herman	Winona	—	11

SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA—continued.			
Engle, Carl.....	Winona.....		17
Fjelstra, Theodore.....	Madelia.....	26	13
Fodstad, Halvor.....	Thief River Falls.....	4	12
Freese, N. W.....	Marshall.....	40	3
Geske, Albert.....	St. Hilaire.....		11
Glotfelter, C. H.....	Waterville.....	47	1
Gorman, T. F.....	Blue Earth.....	4	32
Gove, E. J.....	Bingham Lake.....	31	13
Gray, G. A., & Son.....	Claremont.....	12	7
Greenwold, L. J.....	Anoka.....	66	
Grundhous, Ed.....	Thief River Falls.....		18
Hage, John J.....	Hanska.....	17	
Hagestande, Emil I.....	Madelia, R. 3.....		29
Hannah, J. A.....	Fisher.....	1	9
Hanson, G. H.....	St. Hilaire.....		15
Hazel, C. H. G.....	Mapleton.....	32	3
Holt Bros.....	Rochester, R. 6.....	34	
Holte, P. O.....	Shelly.....	23	9
Houlton, S. R.....	Elk River.....	47	8
Jenson, Carl, & Son.....	Winona.....		16
Jensen, Tinus.....	Manchester.....	26	3
Johnson, E. W.....	Tyler.....	13	10
Johnson, Hon. James.....	Bertah.....	31	28
Kearny, James E.....	Currie.....	36	5
Kellogg, A. C.....	Wykoff.....	10	9
Knauss, C. W.....	Waseca.....	24	
Knutson, A. A.....	Adams, R. 2.....	4	14
Knutson, C. M.....	do.....	6	9
Koerschen, Dietrich.....	Hamburg.....	1	25
Landon, F. C.....	Rushford.....	63	1
Larson, C. A.....	Austin.....	11	
Lee, C. R.....	Villard.....	30	1
Lee, George F.....	Hanska.....	35	1
Letues, Jens.....	Thief River Falls.....	8	4
Lindquist, Fred.....	Olivia.....	2	20
McCabe, John J., & Sons.....	Cleveland, R. 1.....	39	7
McCaill, Mrs. J.....	Lake City.....	47	13
McKercher, R. J.....	St. Hilaire.....	6	11
McMartin, Donald.....	Claremont.....	15	12
McMartin, F., & Sons.....	do.....	44	
McMartin, John.....	Winona.....	23	2
McMartin, Roy.....	do.....	42	
Manahan, Martin.....	Chatfield.....	23	3
March Bros.....	Litchfield.....	80	5
March, C. T.....	Redwood Falls.....	16	6
Martz, J. A.....	St. Hilaire.....		10
Meyer, Wm.....	Glencoe.....	1	39
Michael, Fred.....	Winona.....		21
Norwood, F. F.....	Balaton.....	28	
O'Connell, John D.....	Lesueur Center.....	10	
Olson Bros.....	Glenville.....	35	
Olson, Carl.....	Wahkon.....	1	15
Olson, Ole M.....	Manchester.....	23	13
Olson, Paul.....	St. Hilaire.....		12
Peterson, Anton.....	Hazel.....		17
Peterson, Elias.....	do.....		12
Peterson, Martin.....	do.....		12
Potter, John F.....	Springfield.....	23	3
Putzier, C.....	Litchfield.....	25	26
Ranzau, Otto.....	Glencoe.....		13
Reibe, Henry.....	Winona.....		19
Reimstad, C. J.....	Marshall.....	6	17
Reps, Paul.....	Minnesota City.....		26
Rickert, Herman.....	Luverne.....	26	6
Riordan, Dennis.....	Lamberton.....	40	2
Rose, A. J.....	Wykoff.....	6	6
Rose, Bert.....	Rochester.....	18	13
Rosendahl, Ed.....	Warren.....	21	2
Sanborn, E. D.....	Racine.....	21	2
Sayers, A. L.....	Lakeville.....	25	
Schmidt, G. C.....	Emmons, R. 1.....	19	24
Schneider, G. A.....	Blue Earth.....	54	2
Schwarble & Dank.....	Eagle Lake.....	21	
Searles, S. L.....	Dalton.....	31	
Sharkey, W. J.....	Belleplaine.....	29	8
Shellum, A. W.....	Hanska.....	20	7
Shorter & Sons, L. E.....	Dodge Center.....	24	
Solem, Nels.....	Forest Lake.....	34	
Stensland, E. G.....	Mabel.....	41	
Sterns, Geo. L.....	Thief River Falls.....		10
Stoner, M. E.....	Albert Lea.....	50	

SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
MINNESOTA—continued.			
Streich, Art.	Winona		10
Svenson, A.	St. Hilaire		12
Thorson, L. S.	Dawson	18	21
Tuftie, Iver	Hayward	1	29
Wadsworth, F. W.	Glenville	5	34
Walpole, E. E.	Hancock	22	
Wedge, Percy	Albert Lea, R. 1	3	21
Wellcome, Bert	Sherburn	28	5
Wendland, E. W.	Belton	5	6
West Central Station School	Morris	19	
Do	do		19
Wirth Bros.	Dodge Center	24	17
Wogensen, N. N.	Tyler	51	8
Wolf & Son, R. A.	Morristown	23	
MISSISSIPPI.			
Turner, J. G.	Dixon	4	1
MONTANA.			
Allsop, Ezra	Bozeman	40	
Anceny & Child	do	76	8
Atkins, J. C.	Rosebud	22	11
Bohart, W. O.	Bozeman	5	
Griffin, P. H.	Lo Lo	42	17
Horsley, A. G.	Sioux Pass	20	1
Huffine, J. C.	Bozeman	30	18
Kemmis, Walter D.	Sidney	20	16
Lowe & Powers	Culbertson	63	
Maryott, J. L., & Son	Roberts	41	1
Metzger, F. C.	Rothiemay	22	24
Montana State College	Bozeman	16	
Niebel, Matt.	do	46	
Rhodes, Wm. M.	Sheridan	72	22
Stuckey, J. J.	Bozeman	27	35
Wheeler, W. W. & B. W.	Valley	19	
Wright, James	Crane	3	13
NEBRASKA.			
Hansen, James	Harvard		10
Lamp, A. L.	Inland	35	
Radford, O. A.	Ulysses	7	5
NORTH DAKOTA.			
Akesson, J. B.	Grandin	4	22
Armstrong, John B.	Hannafor	32	3
Arven, Wm.	Bantry	2	16
Bahr, Chris.	Almont	14	1
Barsten, A. H.	Fullerton	7	9
Beiseker, T. L.	Fessenden	18	3
Berg, Lewis	Cooperstown	29	1
Black, Dave	Grandin	35	11
Black, R. W.	Ambrose	22	1
Bliss, J. W.	Pekin	8	28
Brown, H. M.	Russell	11	3
Burbedge, R. H.	Park River	4	7
Byington, J. S.	Sutton	7	6
Clark, D. A.	Brandin	29	
Cool, Ray	Newburg	5	7
Currie, Alex.	Cando	32	17
Dahl, C. P.	Crory	2	8
Dahl, Peter P.	do	4	7
Donally, John, & Son	Grafton	31	12
Duffey, Matthew	Esmond	36	
Erickson, Ed.	Devils Lake	14	4
Ertresvaag, Adolph	Bottineau	18	14
Finke, H. L.	Berthold	42	
Fitzsimonds, Robert C.	Walhalla	8	1
Ford, David	Park River	5	6
Gardner, C. G.	do	24	10
Gibbon, H. C.	Forest River	15	5
Goodman, Grimsie	Milton	26	7
Grenier, Simeon	Thorne	5	17
Hanchett, George E.	Anamoose	12	25
Harris, Frank	Park River	5	3
Harris, John A.	do	16	1
Hefty, T. N.	Walcott	10	
Heine, E. H.	Ellendale	24	27
Heron, J. C.	Sykeston	17	
Hetler, W. P., & Sons	Esmond	9	2
Hill, Fred	Hesper	1	15
Hobbs, John	Park River	15	5
Hobbs, J. N.	do	4	6

SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
NORTH DAKOTA—continued.			
Homes, Pete.....	Park River.....	9	2
Homuth, Martin.....	Kensal.....	15	40
Hudson, E. W.....	Hunter.....	21	9
Johnson, Agnes.....	Grafton.....	3	7
Johnson, C. S.....	Hazen.....	9	.....
Johnson, Ernest N.....	Binford.....	16	6
Johnson, Oscar.....	Park River.....	8	8
Johnson, Sever.....	Mapes.....	4	6
Kabile, Henry.....	McClusky.....	5	11
Kerr Bros.....	Milton.....	10	13
Kirk, J. S.....	Devils Lake.....	94	13
Knutson, Nels, & Son.....	Fullerton.....	20	3
Large, S. L.....	Oriska.....	5	10
Lee, Ole O.....	Williston.....	3	9
Lundell, Nels.....	do.....	13	4
McAllister, D.....	Devils Lake.....	15	5
McDonald, A. W.....	Ellendale.....	16	7
McKee, E. D.....	Valley City.....	.....	19
McLaughlin, D. F.....	Cando.....	31	.....
McLeod, D. C.....	Crary.....	7	11
McNary & Farr.....	Pingree.....	23	7
Magill, Roland.....	Verona.....	42	7
Marr, R.....	Souris.....	13	10
Martin, S. J.....	Westhope.....	6	7
Melby, Geo.....	Hatton.....	5	20
Myrvik, Ole A.....	Milton.....	1	24
Nelson, John G.....	Fullerton.....	38	6
Novak, Chas. J.....	Lankin.....	5	7
Osborne, B. A.....	Devils Lake.....	1	11
Pazandak, Jos.....	Fullerton.....	24	2
Pepoon, A. M.....	Bartlett.....	5	7
Peterson, Mads.....	Ellendale.....	18	.....
Pierce, C. E.....	do.....	8	10
Pieper, Barney.....	Wildrose.....	12	4
Reid, James.....	Courtenay.....	16	3
Ripley, Jos.....	Eldridge.....	31	.....
Roll, H. G.....	Brinsmade.....	7	10
Rorvig, Mathias.....	Binford.....	19	25
Russell, Henry.....	Bottineau.....	6	7
Russell, J. B.....	do.....	16	6
Scaman, Will.....	Noonan.....	32	5
Scott, A. D.....	Fargo.....	91	2
Scott, J. H.....	Forest River.....	14	.....
Stanley Bros.....	Hazen.....	28	.....
Stenhjem, P. A.....	Arnegard.....	34	.....
Syverson, Ola.....	Reynolds.....	8	13
Taplin, Harry.....	Milton.....	15	9
Toms, J. A.....	Bottineau.....	21	4
Trehus, Theo. M.....	Arnegard.....	10	.....
Uglum, Jim.....	Bowbells.....	10	.....
Vie, Ole O.....	Lisbon.....	32	.....
Ward, C. A.....	Hazleton.....	24	8
Wheeler, J. M.....	Marion.....	27	1
Whitcomb, F. L.....	Crary.....	1	10
Whitteron, Chas.....	Bottineau.....	12	1
Wild, John.....	Milton.....	79	6
Winer, Henry.....	Cathay.....	6	10
Wiper & Green.....	Sheldon.....	16	17
Wold, Anton.....	Maddock.....	10	.....
OHIO.			
Huprich, C. E.....	North Lawrence.....	13	.....
McLain, C. B.....	Wauseon.....	17	.....
Parker, L. J.....	Sandusky.....	4	6
Ransom, Ross D. L.....	do.....	1	11
Smith, W. B.....	Fremont.....	12	1
Thomas, Dr. C. H.....	do.....	18	1
Williamson, A. D.....	Xenia.....	12	3
OKLAHOMA.			
Johnston, C. E.....	McLare.....	1	13
OREGON.			
Chalmers, Alex.....	Forest River.....	64	.....
PENNSYLVANIA.			
Altenburg, L. W.....	Townville.....	.....	15
Mack, C. R.....	Titusville, star route.....	.....	20
Mars, E. E.....	Titusville, R. 5.....	.....	13
Peebles, James, & Son.....	Slippery Rock, R. 4.....	7	13
Saul, W. H.....	Greenville, R. 49.....	1	12
Warner, Alex. N.....	Titusville, Lancona Farms.....	48	5

SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
SOUTH DAKOTA.			
Estabrook, L. A.	Cuthbert	42	2
Mueller, E.	Scotland	11	9
Schnuelle, Simon	do.	14	1
Schuring, J. W.	Andover		19
Treick, J. A.	Scotland	7	1
TENNESSEE.			
Butler, J. O., & Son	Humboldt	20	22
Cowan & Cowan	Dickson	39	9
Eleazer, Geo.	do.	43	1
Foute, Dr. E. J.	McGhee	23	10
Hays, H. C.	Pulaski	9	1
Hurt, Robert A.	Jackson	9	1
Jones, W. N., & Son	Concord	20	1
Knapp School of Country Life	Nashville	5	
Middle Tennessee Experiment Station	Columbia	17	2
Officer, J. S.	Sparta	5	6
Petty, J. B.	Bon Aqua	8	5
Rogers, Dr. J. M.	Pikeville	20	7
Smith, Chas. M.	Rogersville	14	3
Stevenson, T. M.	Elkton	12	3
University of Tennessee	Knoxville	12	
West Tennessee Experiment Station	Jackson	15	
Wills Bros.	Mountain City	22	3
Wills, J. N.	do.	5	
Wills, H. T. D.	do.	50	1
UTAH.			
Barton, A. B.	Kaysville	20	13
Nebeker, A., & Son	Laketown	162	8
VIRGINIA.			
Andrews, H. L.	Herndon		11
Bell, W. L.	Round Hill		19
Brown, J. Stanger	Rural Retreat	7	8
Cassell, S. S.	do.	17	
Cole, Fred N.	Chilhowie	6	10
Harrison, A. S., & Son	Herndon	11	2
Lawson, R. M.	Burkes Garden	44	
Michael, D. T.	Charlottesville		10
Senger, I. C.	Linville Depot		19
Smith, W. H.	Charlottesville		28
Weeks, J. H.	do.		20
WISCONSIN.			
Briskey, Chas. E.	Hillsboro	6	24
McPhetres, Wm. M.	Stillwater, Minn.	8	11
Nelson, T. J.	Sechlerville		26
Notseter, John, & Son	Deerfield, Ellen Grove Stock Farm	20	
Rabe, Henry	Hudson	9	
Richards, R.	Hillsboro	7	19
Taylor, H. R.	River Falls	35	
Total (Shorthorn, United States)		7,568	3,135

MILKING SHORTHORN.

VERMONT.			
Burroughs, H. A.	Vergennes		15
WEST VIRGINIA.			
McCutcheon, J. A.	Triadelphia	11	
Total (Milking Shorthorn, United States)		11	15

POLLED SHORTHORN.

MICHIGAN.			
Westfall, Elmer	Edwardsburg	43	
MINNESOTA.			
Fetchenheir, H.	Waldorf	20	
Hanson, M. H.	Murdock	34	
Lamberson, L.	Warren	32	6
Murray, William A., Estate	Wadena	36	
Regnier Brothers	Cottonwood	7	3

POLLED SHORTHORN—Continued.

Name.	Address.	Purebred cattle.	Grade cattle.
NEBRASKA.			
Kreuscher, J. R.	De Witt	24	1
Lohaus, Bernard	Humphrey	40	1
NORTH DAKOTA.			
Marsh, Isaac	Leal	20	2
TENNESSEE.			
Clark, J. A.	Nashville	20	6
Myers, Newton, C.	Greenville	19	15
Zimmerman, Fred	Belvidere	25	24
Total (Polled Shorthorn, United States)		320	65
Total (all breeds, United States)		48,178	32,776

2. SUMMARY, BY STATES, OF ACCREDITED AND ONCE-TESTED HERDS OF LESS THAN 5 PUREBRED OR 10 GRADE CATTLE.

Herds under supervision containing less than 5 purebred or 10 grade cattle.

State.	Once tested without reactors.			Accredited.		
	Herds.	Pure-bred cattle.	Grade cattle.	Herds.	Pure-bred cattle.	Grade cattle.
Alabama	5	7	9	1	3	
Arkansas	6	18	28	1	4	
Colorado	1	2	2			
Connecticut	11	12	41	8	7	22
Delaware	28	12	169			
District of Columbia	83		104	182		274
Florida	515	7	1,529	1		6
Georgia	69		396			
Idaho	213	11	1,391			
Illinois	15	4	81			
Indiana	108	75	549	13	28	68
Iowa	89	45	382	5	9	37
Kansas	3	8	3	1		8
Kentucky	57	84	271	2	15	2
Louisiana	77	54	284	2	1	11
Maine	518	166	2,310	34	27	197
Maryland	136	66	468	12	7	79
Massachusetts	7	7	18			
Minnesota	112	142	720	23		94
Mississippi	89	65	156			
Missouri	148	168	680			
Montana	15	7	61	4	9	23
Nebraska	34	56	138	2	4	15
Nevada	136		1,047			
New Hampshire	2	1	14			
New Jersey	11	3	39	1		4
New York	14	18	103	2	4	8
North Carolina	759	40	2,213	15	1	30
North Dakota	197	209	1,121			
Ohio	119	91	370	6	9	21
Oklahoma	92	28	236			
Oregon	168	114	1,159			
Pennsylvania	166	139	750	95	113	59
Rhode Island	7	1	29			
South Carolina	51	21	257			
South Dakota	28	5	128			
Tennessee	65	13	285	3	8	
Utah	194	15	1,305	3	7	8
Vermont	584	20	1,586	3	6	10
Virginia	216	32	701	31	4	161
Washington	152	196	542			
West Virginia	175	36	707	3	8	3
Wisconsin	61	43	247	15	19	99
Total	5,536	2,041	22,632	468	293	1,739

3. SUMMARY LIST, BY BREEDS, OF ACCREDITED AND ONCE-TESTED HERDS OF LESS THAN 5 PUREBRED OR 10 GRADE CATTLE.

Herds under supervision containing less than 5 purebred or 10 grade cattle.

Breed.	Once tested without reactors.			Accredited.		
	Herds.	Pure-bred cattle.	Grade cattle.	Herds.	Pure-bred cattle.	Grade cattle.
Aberdeen Angus.....	22	27	88	3	4	6
Ayrshire.....	63	37	190	1	4	.....
Brown Swiss.....	12	13	49	.....	.....	.....
Dutch Belted.....	1	.....	3	1	.....	8
Guernsey.....	389	200	1,617	67	55	242
Hereford.....	56	56	248	3	5	16
Polled Hereford.....	1	4	3	.....	.....	.....
Holstein-Friesian.....	1,072	559	5,209	154	72	608
Jersey.....	3,175	591	10,994	204	115	757
Red Polled.....	31	24	150	.....	.....	.....
Shorthorn.....	710	527	4,061	25	38	102
Polled Shorthorn.....	4	3	20	.....	.....	.....
Total.....	5,536	2,041	22,632	458	293	1,739

4. TOTAL NUMBER, BY STATES, OF ACCREDITED AND ONCE-TESTED HERDS.

Total number of cattle, by States, in herds, large and small, accredited or once tested without reactors.

State.	Once tested without reactors.			Accredited.		
	Herds.	Purebred cattle.	Grade cattle.	Herds.	Purebred cattle.	Grade cattle.
Alabama.....	79	273	2,597	34	592	871
Arkansas.....	53	700	204	14	281	53
Colorado.....	2	30	2	.....	.....	.....
Connecticut.....	58	757	518	18	225	93
Delaware.....	45	96	331	10	526	99
District of Columbia.....	94	30	253	190	111	594
Florida.....	1,295	213	8,741	21	200	651
Georgia.....	180	722	3,083	8	331	86
Idaho.....	526	1,702	5,509	8	92	170
Illinois.....	293	4,006	1,853	70	1,950	339
Indiana.....	392	3,471	3,548	121	1,883	726
Iowa.....	377	3,379	4,137	44	876	290
Kansas.....	81	4,198	2,497	80	1,687	586
Kentucky.....	270	3,114	3,196	55	778	325
Louisiana.....	153	353	2,198	28	262	682
Maine.....	941	2,905	7,077	127	1,015	967
Maryland.....	261	709	2,166	103	804	1,261
Massachusetts.....	34	885	258	21	404	72
Michigan.....	133	2,496	249	103	2,375	232
Minnesota.....	994	8,141	13,304	494	8,369	5,282
Mississippi.....	288	1,518	3,690	59	1,039	1,162
Missouri.....	585	7,514	5,894	6	170	51
Montana.....	97	1,589	2,541	48	1,269	1,040
Nebraska.....	205	3,130	1,278	29	611	114
Nevada.....	297	613	5,383	1	5	12
New Hampshire.....	30	449	359	7	172	8
New Jersey.....	21	280	71	28	612	412
New York.....	186	3,371	1,869	47	1,170	453
North Carolina.....	1,045	971	7,261	105	548	1,610
North Dakota.....	936	4,733	10,462	172	3,075	1,270
Ohio.....	714	6,697	4,027	104	1,914	324
Oklahoma.....	228	1,536	2,411	1	1	13
Oregon.....	263	1,105	2,252	30	824	118
Pennsylvania.....	639	3,871	3,970	261	1,894	1,981
Rhode Island.....	10	121	30	5	68	27
South Carolina.....	153	423	2,597	34	441	781
South Dakota.....	124	1,044	1,341	15	297	140
Tennessee.....	292	2,028	3,558	86	2,269	720
Texas.....	51	1,231	1,818	.....	.....	.....
Utah.....	377	427	3,724	36	927	395
Vermont.....	1,343	3,677	12,325	63	961	832
Virginia.....	591	1,826	6,907	354	2,370	6,629
Washington.....	264	1,393	1,822	16	439	38
West Virginia.....	763	622	3,920	29	427	285
Wisconsin.....	835	8,789	9,131	287	4,207	2,721
Wyoming.....	1	.....	17	.....	.....	.....
Total.....	16,599	97,138	160,439	3,370	48,471	34,515

5. TOTAL NUMBER, BY BREEDS, OF ACCREDITED AND ONCE-TESTED CATTLE.

Total number of cattle, by breeds, in herds, large and small, accredited or once tested without reactors.

Breed.	Once tested with- out reactors.		Accredited.	
	Purebred cattle.	Grade cattle.	Purebred cattle.	Grade cattle.
Aberdeen Angus.....	3, 286	2, 095	2, 072	594
Ayrshire.....	2, 315	2, 137	1, 291	274
Brown Swiss.....	686	350	387	63
Devon.....	82	25	34	6
Dutch Belted.....	48	271	18	8
Galloway.....	123	143	38	40
Guernsey.....	9, 049	15, 538	6, 651	6, 003
Hereford.....	13, 014	6, 277	5, 117	1, 816
Polled Hereford.....	1, 120	197	777	122
Holstein-Friesian.....	26, 916	45, 859	11, 141	12, 599
Jersey.....	18, 045	56, 160	10, 369	9, 525
Red Polled.....	1, 675	1, 265	1, 189	155
Shorthorn.....	20, 249	29, 601	7, 606	3, 237
Milking Shorthorn.....	162	287	11	15
Polled Shorthorn.....	368	234	320	58
Total.....	97, 138	160, 439	47, 021	34, 515

6. SUMMARY LIST, BY STATES, OF ADDITIONAL HERDS UNDER SUPERVISION, BUT CONTAINING ONE OR MORE REACTORS.

Herds under supervision, but containing one or more reactors.

State.	Herds.	Purebred cattle.	Grade cattle.
Alabama.....	41	564	1, 575
Arkansas.....	4	53	28
Connecticut.....	84	1, 163	1, 488
Delaware.....	55	78	527
District of Columbia.....	4	.....	79
Florida.....	180	.....	5, 046
Georgia.....	39	208	1, 239
Idaho.....	79	851	1, 131
Illinois.....	197	4, 089	1, 976
Indiana.....	124	2, 149	1, 276
Iowa.....	320	6, 238	4, 687
Kansas.....	69	1, 846	855
Kentucky.....	57	694	1, 138
Louisiana.....	87	693	3, 226
Maine.....	163	628	1, 800
Maryland.....	194	1, 024	2, 827
Massachusetts.....	27	846	390
Michigan.....	69	2, 265	163
Minnesota.....	372	5, 063	5, 505
Mississippi.....	14	131	255
Missouri.....	120	3, 797	2, 130
Montana.....	20	648	458
Nebraska.....	124	4, 018	880
Nevada.....	138	95	2, 645
New Hampshire.....	26	444	309
New Jersey.....	53	518	1, 356
New York.....	319	6, 851	4, 893
North Carolina.....	73	306	1, 992
North Dakota.....	319	3, 055	4, 668
Ohio.....	370	5, 100	3, 271
Oklahoma.....	123	2, 332	1, 485
Oregon.....	89	889	1, 894
Pennsylvania.....	176	3, 022	1, 855
Rhode Island.....	15	198	95
South Carolina.....	41	551	1, 216
South Dakota.....	68	1, 065	934
Tennessee.....	66	1, 145	1, 189
Texas.....	23	310	812
Utah.....	39	55	1, 699
Vermont.....	565	3, 920	12, 530
Virginia.....	193	769	5, 084
Washington.....	53	1, 401	588
West Virginia.....	33	152	596
Wisconsin.....	320	7, 998	3, 476
Total.....	5, 545	77, 312	91, 266

**UNIFORM METHODS AND RULES FOR TUBERCULOSIS-FREE
ACCREDITED HERDS OF CATTLE.**

Unanimously Adopted by the United States Live Stock Sanitary Association and by Representatives of Purebred Cattle Breeders' Associations, and Approved December 23, 1917, by the United States Bureau of Animal Industry, with Amendments Adopted December 3, 1919.

1. A tuberculosis-free accredited herd is one which has been tuberculin-tested by the subcutaneous method, or any other test approved by the Bureau of Animal Industry, under the supervision of the Bureau of Animal Industry, or a regularly employed veterinary inspector of the State in which cooperative tuberculosis eradication work is conducted by the United States Department of Agriculture and the State. Further, it shall be a herd in which no animal affected with tuberculosis has been found upon two annual or three semiannual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin-tested or retested at such time as is considered necessary by the Federal and State authorities.

3. No cattle shall be presented for the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. An accredited herd in which not more than one reactor is found at a subsequent tuberculin test may be reinstated to the list if the entire herd passes a successful test without reactors; said test to be applied not less than six months from the date when the reactor is removed from the herd and farm, providing the owner has complied with all the requirements with reference to the introduction of additional animals to the herd, and also all other requirements of the accredited-herd plan.

5. No cattle other than those of an accredited herd shall be added to an accredited herd or to a herd that is in the process of accreditation until they have passed two tuberculin tests applied at intervals of not less than 60 days or more than 90 days by a regularly employed State or Federal veterinarian or by a veterinarian specially authorized by the State and bureau to conduct such tests. The cattle may after passing the first test be placed on the farm or premises containing an accredited herd or one in the process of accreditation, but must not be allowed to associate with said herd until after passing the second test.

6. (a) When a herd has been officially accredited continuously by the United States Department of Agriculture and State for a period of 2 years, it may then be tuberculin-tested annually by any veterinarian whose name is upon the accredited list of veterinarians approved of by the United States Bureau of Animal Industry provided that before any veterinarian other than one who devotes his entire time to the work of any State or the Bureau of Animal Industry can be approved for accredited-herd work, he shall have passed an examination conducted by the proper live-stock sanitary official of the State in which he resides, and the Bureau of Animal Industry. He then shall be eligible to conduct annual tuberculin tests upon herds which have been officially accredited upon dates approved of by the proper State live-stock sanitary official and the Inspector in Charge of the Bureau of Animal Industry in the State wherein the herd is located.

(b) No herd test can be made by such an approved veterinarian unless he has instructions in writing from the State official to that effect. The dates of the annual tests for each herd shall be recorded in the State office and, also, in the office of the inspector in charge. On any annual test the State and Bureau reserve the right to have a regularly employed official present on the farm to supervise the testing done by the approved veterinarian.

(c) The approved veterinarian shall conduct each test strictly in accordance with instructions issued by the Bureau of Animal Industry to employees engaged in cooperative tuberculosis-eradication work. At the conclusion of each test, the approved veterinarian shall submit to the State veterinarian and the inspector in charge of the Bureau of Animal Industry a copy of the record of the test.

(d) Any animal of a herd under supervision which may react in any herd tuberculin tested by an approved veterinarian shall be marked for the purpose of identification in accordance with the regulations of the State in which the animal is located.

(e) Tuberculin tests applied by veterinarian other than those regularly employed by the State and the Bureau of Animal Industry shall be paid for by the owner of the herd.

7. Before a herd can be accredited the stables and premises shall be placed in a sanitary condition. When reactors are disclosed as the result of any test, they must be immediately removed from the farm and the stables thoroughly cleaned and disinfected before the herd shall be identified as in process of accreditation.

8. Prior to each tuberculin test satisfactory evidence of the identity of the registered animals shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with the animals of the herd, shall be identified by a tag or other marking satisfactory to the State and Federal officials.

9. All removals of registered cattle from the herd, either by sale, death, or slaughter, shall be reported promptly to the said State or Federal officials, giving the identification of the animal and, if sold, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed to associate with the herd which have not passed a tuberculin test approved by the State and Federal officials.

10. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurized by heating to not less than 150° F. for not less than 20 minutes.

11. All reasonable sanitary measures and other recommendations by the State and Federal authorities for the control of tuberculosis shall be complied with.

12. Cattle from an accredited herd may be shipped interstate, by certificate obtained from the office of the State live-stock sanitary officials of the State in which the herd is located or from the office of the Bureau of Animal Industry, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

13. Strict compliance with these methods and rules shall entitle the owners of tuberculosis-free herds to a certificate, "Tuberculosis-Free Accredited Herd," to be issued by the Bureau of Animal Industry and the State live-stock sanitary authority. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

14. A supplementary list shall be made to the accredited-herd list to contain the names of the owners of purebred herds that are found free from tuberculosis on two annual tuberculin tests but in which the herd bull reacted. Such herds shall not receive an accredited-herd certificate. The reacting bull may be used under the following conditions:

(a) He shall have passed a satisfactory physical examination and be kept in isolation and quarantine under State supervision.

(b) When it is desired to breed cattle to the reacting bull, such cattle shall be taken to the bull and bred on neutral ground. The bull shall be controlled on a staff or halter.

15. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered as sufficient cause for immediate cancellation of cooperation with them by the State and Federal officials.

Amendments adopted December 3, 1919.

RECORD OF PROGRESS IN ACCREDITED-HERD WORK.

Arranged in order of accredited herds.

June 30, 1920.

State.	Accredited herds.	Once-tested free herds.
1. Minnesota	494	994
2. Virginia	354	591
3. Wisconsin	287	835
4. Pennsylvania	261	639
5. District of Columbia	190	94
6. North Dakota	172	936
7. Maine	127	941
8. Indiana	121	392
9. North Carolina	105	1,045
10. Ohio	104	714
11. Maryland	103	261
12. Michigan	103	133
13. Tennessee	86	292
14. Kansas	80	81
15. Illinois	70	293
16. Vermont	63	1,343
17. Mississippi	59	288
18. Kentucky	55	270
19. Montana	48	97
20. New York	47	186
21. Iowa	44	377
22. Utah	36	377
23. South Carolina	34	153
24. Alabama	34	79
25. Oregon	30	263
26. West Virginia	29	763
27. Nebraska	29	205
28. Louisiana	28	153
29. New Jersey	28	21
30. Florida	21	1,295
31. Massachusetts	21	34
32. Connecticut	18	58
33. Washington	16	264
34. South Dakota	15	124
35. Arkansas	14	53
36. Delaware	10	45
37. Idaho	8	526
38. Georgia	8	180
39. New Hampshire	7	30
40. Missouri	6	585
41. Rhode Island	5	10
42. Nevada	1	297
43. Oklahoma	1	228
44. Texas .....	.....	51
45. Colorado .....	.....	2
46. Wyoming .....	.....	1
Total	3,370	16,599

B

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN

SUPPLEMENT 1 TO
HERD LIST NO. 3

LIST OF HERDS OF AYRSHIRE, GUERNSEY, HOLSTEIN-
FRIESIAN, AND JERSEY CATTLE WHICH HAVE PASSED
ONE OFFICIAL TUBERCULIN TEST WITH A VIEW TO
BEING ACCREDITED

Tuberculosis Eradication Division
J. A. KIERNAN, Chief



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 143

Contribution from the Bureau of Animal Industry
JOHN R. MOHLER, Chief

Washington, D. C.

Revised to June 30, 1920

CONTROL with a view to the eventual eradication of tuberculosis in cattle is being accomplished by the systematic efforts of Federal and State authorities in cooperation with cattle breeders' associations and herd owners.

A plan was adopted in 1917 whereby herds of cattle passing the prescribed number of official tuberculin tests should be certified or accredited as free from tuberculosis.

An accredited herd is one that has passed successfully two annual or three semiannual tuberculin tests applied by regularly employed veterinary inspectors of the Bureau of Animal Industry or of the State where cooperative work is conducted, and has otherwise complied with the regulations governing the work.

The following list shows herds that have passed successfully one test, without reactors, with a view to certification. If the status of any of the herds in this list is changed, prompt notice of the fact will be furnished to the officials of the various States.

The breeds of cattle, the names of the owners, and the States in which the herds are located are arranged in alphabetical order.

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN.

SUPPLEMENT 1 TO HERD LIST NO. 3.

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Guernsey.....	6
Holstein-Friesian.....	20
Jersey.....	61

NOTE.—For a list of accredited herds of all breeds and of once-tested herds of breeds not included here, apply to the Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

LIST OF HERDS OF AYRSHIRE, GUERNSEY, HOLSTEIN-FRIESIAN, AND JERSEY CATTLE WHICH HAVE PASSED ONE OFFICIAL TUBERCULIN TEST WITH A VIEW TO BEING ACCREDITED.

AYRSHIRE.

Name.	Address. .	Cattle once tested with- out reactors.	
		Purebred.	Grade.
ARKANSAS.			
University of Arkansas.....	Fayetteville.....	6	.....
CONNECTICUT.			
Avery, John D.....	North Stonington.....	12	17
Farnham Tobacco Corporation.....	East Windsor Hill.....	22	.....
DELAWARE.			
Caulk, L. D.....	Woodside.....	13	3
FLORIDA.			
Highland Oak Farm, Burdett Loomis, manager.	Pierce.....	24	4
ILLINOIS.			
Fahler, W. E.....	Mendota.....	15	3
Spicer, Zenus.....	Monmouth.....	6	9
INDIANA.			
Brookside Farm Co.....	Fort Wayne.....	23	1
Ritter, M. A.....	Valparaiso.....	18	.....
IOWA.			
Brewster, Earl.....	Sheldon.....	7	.....
Iowa State College.....	Ames.....	11	.....
Peverill, C. H.....	Waterloo.....	28	.....
KANSAS.			
Bahnmaier, J. G.....	Lecompton.....	26	8
Campbell, Robert P.....	Attica.....	48	5
Dodson, Stokes.....	Carbondale.....	7	6
Davis, Joel D.....	Emporia, R. 5.....	3	15
Hoffman, H. H.....	Abilene.....	27	3
Johnson, L. E.....	Waldron.....	30	.....
Linn, John, & Sons.....	Manhattan.....	51	15
Moncrief, Wm.....	Dodge City.....	17	26

AYRSHIRE—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE.			
Andrews, J. O. & O. D.	Exeter	12	3
Atwood, F. J.	Sabbatus	8	7
Day, Harold S.	Lewiston	37	5
Dingley, Frank	Livermore Falls	5	13
Hersey, W. A.	Norway	10	3
Hodgkins, John B.	Lewiston	21	3
Keene, E. A.	Danville Junction	3	15
Porter, Ira	West Houlton	7	8
Pride Bros.	East Waterford		17
Prince, J. M.	Walnut Hill		15
Victory, W. R.	West Houlton		10
Welts, E. E.	Caribou	15	9
Willard, Leonard	Waterville	6	4
MARYLAND.			
Massey, Saml. J.	Barclay	25	5
Warnick, Noah	Grantsville		18
Watters, Sidney	Monkton	1	22
MASSACHUSETTS.			
Howe, Henry S.	Holliston	13	
Scott, W. T.	Hawley	22	
MICHIGAN.			
Ford, E. L.	1622 Ford Building, Detroit	6	
MINNESOTA.			
Cowles, Dwight N.	Pine Island	16	16
Lynch, R. E.	Zimmerman	12	6
Miller, Ray G.	Pine Island		19
Neumann, Mrs. Aug.	Princeton	7	8
Rombaugh, D. S.	Villard	21	4
Sturges, J. D., & Bro.	Buffalo	6	8
University of Minnesota Dairy Farm	St. Paul	5	
White & Chambers	Havana	9	1
Wilsie, E. M.	Dorset	2	6
MISSOURI.			
Hunze, J. W.	Cape Girardeau	4	17
NEBRASKA.			
Griffing, W. L.	Table Rock	6	11
NEVADA.			
Dangberg Land & Live Stock Co.	Minden	12	
Sauer Bros.	Franktown	8	213
NEW HAMPSHIRE.			
Fobes, J. W.	Sugar Hill	36	
Melanson, Joseph I.	Wolfeboro	12	
NEW YORK.			
Arords, Francis	Friendship	9	6
Beaver, Gilbert	Yorktown Heights	64	51
Davidson, L. S.	Friendship	16	2
Fisher, J. B.	Whallonsburg	4	11
Fuller, W. W.	Ossining	16	
Gurnsey, L. C.	Woodhull	25	
Hart, Earl	Ballston Lake	8	
Kellogg, H. T.	Valcour	23	32
Kenyon, S. H.	Friendship	20	
Read, Mrs. W. A.	Purchase	10	2
Spooner, A. F.	Richville	94	
Utter, F. R.	Friendship	6	
Wright, F. S.	Worcester	2	35
NORTH CAROLINA.			
Tufts, Leonard	Pinehurst	68	66

AYRSHIRE—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH DAKOTA.			
Huso, T. O.....	Crosby.....	5	11
Penple, Frederick.....	Carrington.....	7	5
Zimmerman, R. C.....	Wimbledon.....		15
OHIO.			
Allen, James, & Son.....	Poland.....	23	
Angevine, C. H.....	Pataskala.....	5	38
Dietz, G. C.....	Akron.....	8	11
Evamere Farm.....	Hudson.....	48	
PENNSYLVANIA.			
Bechtel, Wm. J. W.....	Bechtelsville.....	10	1
Byrne's Patrick, Sons.....	St. Joseph.....	39	
Druckemiller, W. H.....	Sunbury, Crestmont Farm.....	30	
Gladfelter, W. L.....	Spring Grove, Old Forge Farm.....	35	2
Harrison, William N.....	Wellsboro, R. 7.....	25	5
McDowell, A., Estate.....	Sharon, R. 58, McDowell Farm.....	6	26
McKean County Home.....	Smethport.....	13	25
Marshall, C. J., & Kier, C. M.....	Ulster.....	2	11
Mosier, Ray A.....	Eldred, R. 4.....	4	10
Neale, John C.....	Sewickley, Blackburn Farm.....	45	
Rockefeller, G. A.....	Smethport.....	8	13
Sycamore Farms, P. F. Krause, man- ager.....	Douglassville.....	27	
Templeton, Robt., & Son.....	Ulster.....	28	
Tonner, Wm. T.....	Torresdale.....	40	
Williams, Ivan.....	New Milford, Fairview Farm.....	1	12
RHODE ISLAND.			
Church, G. L.....	Providence.....	38	
SOUTH CAROLINA.			
Sumter Sanitary Dairy.....	Sumter.....	19	31
VERMONT.			
Anderson, A. J.....	West Glover.....	33	3
Anderson, Mary.....	East Berkshire.....		33
Blaisdell, W. R.....	Randolph.....	5	12
Blanchard, Harry.....	Barre.....		17
Bostwick, George H.....	Vergennes.....	2	18
Button, Archie.....	Washington.....	3	9
Cady, C. A.....	Chelsea.....	9	9
Clifford, Bert A.....	Danville.....	2	13
Collins, A. J.: Lakewood Farm.....	Swanton.....		15
Rented Farm.....	do.....		27
Cutts, W. H.....	Barre.....		22
Dike, D. B.....	Starksboro.....		39
Duell, Zeb.....	Burlington.....		23
Erskine, Martin C.....	Williamstown.....	36	9
Hadwen, J. E.....	Springfield.....	5	8
Halle, J. R.....	Montgomery Center.....		22
Hammond, Scott C.....	Brandon.....	19	5
Hannah, Matthew.....	Brownsville.....	18	
Hopkins, H. P.....	Richford.....		19
Huntoon, R. C.....	Wallingford.....		32
Jewett, Charles L.....	Middlebury.....	24	
Jewett, Samuel.....	do.....	21	25
Knowles, George M.....	Randolph.....	3	28
Ladd, C. S.....	Norwich.....	8	3
Ladeau, George.....	Bristol.....		18
Lyndes, A. A.....	Marshfield.....		12
Macy, H. H.....	Montgomery Center.....		45
Martin, T. T.....	Barre.....	20	
Norcross, W. C.....	Waterbury.....	2	31
Paul, Dick W., Hill Farm.....	East Berkshire.....		38
Perry Bros. & Wilson.....	Randolph.....	75	
Powers, J. B. & W. S.....	Troy.....	2	31
Pratt, F. S.....	Montgomery.....		19
Saulter, L. L.....	Chelsea.....	2	3
Spaulding, F. E., & Son.....	Royalton.....	17	
Trombley, Joseph.....	Morrisville.....		25
University of Vermont.....	Burlington.....	12	

AYRSHIRE—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Vaughn, R. H.	Thetford Center.....	18	.....
Vermont Industrial School.....	Vergennes.....	32	22
Vermont Marble Co. (Griggs Farm).....	Proctor.....	50	.....
Wheeler, H. H. & W. A.: Home Farm.....	South Burlington.....	8	66
South Farm.....	do.....	1	40
Young, T. D.....	Vergennes.....	9	12
VIRGINIA.			
Cardwell, F. H.....	Hampton.....	3	13
WASHINGTON.			
Harrison, J. M.....	Sedro-Woolley.....	12	.....
Lauckhart, William.....	Lynden.....	20	.....
Van Tassell, E. W.....	Wenatchee.....	27	.....
Washington State College.....	Pullman.....	12	.....
WEST VIRGINIA.			
Schnetz, Wm. A.....	Wheeling, R. 1.....	3	31
Tabb, James E.....	Kearneysville.....	10	29
WISCONSIN.			
Cook, John J.....	Burlington.....	8	23
Craig, Wm. F.....	Royalton.....	3	30
De Master, John.....	Cedar Grove.....	20	1
De Master, Will.....	Oostburg.....	2	11
Engel, Henry.....	Neenah.....	9	6
Finn, James.....	Whitewater.....	19	.....
Ihde, Herman, & Son.....	Neenah.....	20	3
Ihde, John.....	do.....	22	17
Jones, Rufus A.....	Black River Falls.....	17	.....
McNab, A. J.....	do.....	25	1
Marquart, Edwin B.....	Knowles.....	22	6
Walvoord, J. B.....	Oostburg.....	16	1
Total (Ayrshire, United States).....	.....	2,278	1,947

GUERNSEY.

ALABAMA.			
Claybaugh & Sparks	Gallion	5	42
CONNECTICUT.			
Buckingham, S. McLean	Waterbury	9	16
Cheney, Robert	South Manchester	11	.....
Deming, H. P.	Winsted	29	1
Dove, John	Litchfield	37	5
Gaylord, E. B.	Winsted	.....	21
Hendee, Geo. M.	Suffield	3	18
Kelsey, David A.	South Manchester	2	30
McKnight, John T.	Ellington	9	16
Mitchelson, Ariel	Tariffville	33	11
Moore, E. A.	New Britain	49	5
Scoville, H. & R.	Taonic	85	.....
Thomas, E. S., Estate	Groton	21	.....
Webster, W. F. & A. B.	Litchfield	10	23
Whitney, Miss E. F.	Columbia	21	.....
York, C. B.	Stonington	.....	10
DELAWARE.			
Crossland, J. Howard	Delaware City	.....	35
Foster, A. L.	Montchanin	2	10
GEORGIA.			
State College of Agriculture	Athens	10	.....

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
IDAHO.			
Daiss, John.....	Buhl.....	6	.....
Harsbarger, J. T.....	Filer.....	2	14
Nicholson, D.....	St. Maries.....	1	12
Nihart, A. H.....	Buhl.....	9	.....
Parry, Lester G.....	Wendell.....	18	1
Rodenbaugh, Will M.....	Caldwell.....	.....	10
Check, Henry.....	Buhl.....	15	.....
Tatruan, F. N.....	Wendell.....	.....	17
Turner, C. O.....	Eagle.....	1	11
ILLINOIS.			
Hess, J. B.....	Momence.....	3	7
Kellogg, L. D.....	Deerfield.....	17	36
Laird, John J.....	Dix.....	1	15
Manning, C. B.....	Shelbyville.....	3	5
Martin, I. M.....	La Harpe.....	10	21
Sommer, J. D.....	Metamora.....	2	9
Williams, David.....	Lake Forest.....	48	1
INDIANA.			
Adair & Laffin.....	Lebanon.....	4	20
Benthall, Otis.....	Mount Vernon.....	.....	15
Black, C. F., & R.....	do.....	21	6
Butler, Mark.....	do.....	10	15
Carlisle, C. A.....	South Bend.....	22	3
Grady, Hardy.....	Veedersburg.....	5	6
Hershberger, C., and Schlosser, F.....	Bremen.....	29	.....
Hesler, Alfred J.....	Veedersburg.....	6	25
Howard, Harry.....	Lebanon.....	2	19
Johnson, Sylvanus.....	Mount Vernon.....	.....	10
Kiefer, Henry.....	Bremen.....	1	31
Kiefer, William.....	do.....	1	21
Knight, R. E.....	Mount Vernon.....	1	12
Lyon, Jasper.....	Upland.....	1	11
Nelson & Son, S. O.....	Lebanon.....	5	10
Pickett, Arthur.....	Bloomingsdale.....	5	20
Ritzert, Henry J.....	Mount Vernon.....	.....	14
St. Mary's Academy.....	Notre Dame.....	9	149
Sahlhoff, Carl E.....	Bremen.....	10	.....
Schlosser, Walter K.....	Plymouth.....	5	6
Sheets, Arthur.....	Bremen.....	3	16
Simpson, Geo. R.....	Owensville.....	12	1
Stein, Edward N.....	Mount Vernon.....	.....	11
Stillwell & Seggerman.....	Granger.....	2	18
Trimble, G. A.....	Evansville.....	12	.....
Worster, O. M.....	Warren.....	8	3
IOWA.			
Barr, A. M.....	Grinnell.....	.....	17
Bender, C. R.....	Wellman.....	.....	23
Blome, Conrad.....	Ledyard.....	1	23
Brooks, H. E.....	Burlington.....	8	.....
Coppock, Robert E.....	West Branch.....	6	8
Gilchrist, W. C.....	Pocahontas.....	.....	30
Hershberger, J. L.....	Kalona.....	1	23
Iowa State College.....	Ames.....	23	.....
McCoid & Hubbard.....	Logan.....	2	58
Marner, G. G.....	Parnell.....	1	11
Myhr, A. B.....	Thompson.....	1	19
Oak Hill Guernsey Co.....	Estherville.....	7	1
Steckley, Sam R.....	Kalona.....	1	15
Swartzendrieber, E. G.....	Wellman.....	2	20
Swartendruher, D. B.....	Kalona.....	3	17
Yoder, Andrew A.....	do.....	.....	10
Yoder, W. M.....	Parnell, R. I.....	.....	12
KANSAS.			
Holmes, W. W.....	Oswego.....	5	1
Kissinger, E. R., & Son.....	Ottawa.....	15	12
Marley, J. W.....	Oswego.....	10	.....
Perrenoud, John.....	Humboldt.....	10	16
Porter, J. E.....	Beloit.....	7	11

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE.			
Batchelder, Wm.	Sanford.	4	17
Benn, Geo. H.	Houlton.	21	
Blair, Lyman.	Greenville.	12	
Bonney, C. A.	Turner.	1	14
Brackett, W. S.	Waterville.		11
Brown, Chas. W.	Windsor.	23	4
Brown, Leonard S.	West Scarboro.		11
Butler, Guy V.	Franklin.		16
Call, Everett D.	Pittsfield.	7	10
Clark, Fred.	Madison.	4	26
Coffin, Herbert E.	Berwick.	10	
Crocker, E. G.	St. Albans.	26	
Day, Albert P.	West Kennebunk.	3	9
Deering, A. M., & Son.	Bridgton.	12	13
Dole, C. H.	Brewer.		12
Dondero, C. G.	Augusta.	39	
Elliott, Geo. W.	Waterville.		12
Hall, Thomas G.	Alfred.		10
Hart, Edw. R.	Brewer.	2	12
Hill, F. T., & Son.	Greene.	1	10
Horton, W. S.	Blue Hill.	4	11
Ireland, Hosea W.	Waterville.		11
Johnson, H. O.	East Sullivan.		10
Jordan, B. F.	Waltham.		13
Leach, Fred H.	Alfred.		14
Libby, Lester J.	Sabattus.	8	7
Lunn, Ezra S.	Waterville.		13
Margrave, Bradley.	Penobscot.		12
Milliken, E. C.	West Scarboro.	4	17
Moors, Veral.	Lee.	1	15
Morgan, Frank M.	Augusta.		13
Morrill, D. J., & F. L.	Cornish.	15	
Newman, D. L.	Wilton.	10	8
Norton, Ralph S.	Portland.	11	1
Perkins, J. A.	Nobleboro.	1	9
Pettengill, W. R.	Curtis Corner.	4	18
Pike, Asa O.	Fryeburg.	4	9
Ramsey, John.	Waterville.		10
Ricker, Fred N.	Alfred.	2	11
Rose, Oliver N.	Greene.	15	6
Russell, Cony.	Norridgewock.	16	18
Russell & Son, J.	West Kennebunk.	4	9
Smith, Harold.	Monmouth.	3	9
Smith, Samuel C.	West Kennebunk.		10
Souther, Ernest L.	Livermore Falls.	4	10
Stanley, Samuel B.	West Lebanon.	2	8
State Prison Farm.	Thomaston.	21	20
Stephens, P. C.	East Sumner.	6	8
Stevens, A. D.	Waterville.		10
Stevens, Leland H.	Alfred.		10
Stuart, Will.	Solon.		14
Thompson, T. S.	Waterville.	2	13
Trafton, Louis F.	Sanford.	18	27
Walker Bros.	Biddeford.		12
Whitehead, Frank E.	Saco.	9	3
MARYLAND.			
Abry, Phillip K.	Easton.	9	8
Baile, John S.	New Windsor.	1	18
Bird, J. Irving, jr.	Birdsville.		10
Coale, H. D.	Aberdeen.		35
Culler, M. L.	Sharpsburg.	1	10
English, M. A.	Rockville, R. R.	1	11
Foard, Wm. M.	White Hall.		16
Gibson, Howard W.	Bel Air, R. 3.		10
Graybill, L. C.	Lewistown.	1	11
Heck, Chas. H.	Bel Air.		16
Herrman, Jas. F.	Forest Hill.		13
Hibberd, G. H.	New Windsor.	13	
Hoen, Frank J.	Corbett.	6	3
Hummer, R. M.	Detour.	6	13
Kelley, Jas. C.	Street.		19
Kelly, M. P.	Bel Air, R. 3.		10
Lanahan, W. W.	Timonium.	6	
Lare, Harry B.	Walkersville.		14
Newcomb, H. T.	Bethesda.	22	4
Oldfield, W. L.	Rocks.	5	14
Othoson, E. T.	Kennedysville.	3	23

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MARYLAND—continued.			
Sadtler, Howard P.	Timonium	5	1
Starr, A. M.	Sparks		11
Trittipoe, Wm. M.	Lander		19
Truesdell, Geo.	Deer Park	7	
Urie, Jas. W.	Kennedyville	14	
Wheeler, H. Wilson	Street	3	24
Willis, Wm. A.	Easton	1	27
Wilson, S. W.	Pylesville	2	33
Yoder, Harvey S.	Grantsville	3	14
MASSACHUSETTS.			
Dutton, C. E.	Edgartown	1	13
Gallup, W. A.	North Adams	17	15
Merrill, S. M.	Ipswich	8	1
Mixter Farm	Hardwick	243	
Mount Hope Farm	Williamstown	11	11
Reynolds, J. P.	Holliston	8	
Schlehuber, Andrew	Lynn	9	4
Timmins, Capt. Geo. H.	Ware	15	21
MICHIGAN.			
Barbour, W. T.	1360 Jefferson Avenue, Detroit	23	
Brown, W. J.	Redford	19	2
Himmelberger, E. J.	Lansing	19	
Holbeck, Fred C.	Long Lake	17	12
Holmes, Robert	Grand Rapids	13	5
Ray, G. W. & H. G.	Albion	24	
Ruehs, F. W.	Caledonia	13	1
Scott, H. B.	Grosse Isle	10	
Torrey, Dr. H. N.	David-Whitney Building, Detroit	8	2
MINNESOTA.			
Abrahamson, H. B.	Dassel	4	28
Agrimson, John	Whalan	2	20
Alexander, Wm. M.	Rockville	3	6
Arnold Bros.	Watkins	31	1
Bancroft, J. L.	Mora	11	4
Bemis, W. M.	Long Prairie	13	17
Benjamin, Mrs. R. G.	Hutchinson	3	19
Bentz, Herman	Mora		36
Bergeson, Alfred	Leonard		12
Boyd, Amos	Mora		11
Brinkman, J. C.	Zumbrota	4	14
Brooks, Chas.	Mankato	3	18
Brown, Burt	Judson	1	9
Brownell Bros.	Grand Meadow	2	31
Brunz, Louis R.	Good Thunder	6	27
Budde, Herman	Nerstrand	7	24
Busch, Paul	Lake Elmo		12
Carlson, Alfred	Hallock		13
Christianson, Aug. C.	Hinckley	3	12
Cook, F. C.	Mora	6	18
Crosby, J.	Goodridge	1	9
Cupp, J. P.	Ogilvie	2	18
Eivarrison, Oscar	Starbuck		19
Elliott, Ezra	Villard	6	8
Elness, Olaf	Garfield	6	15
Ferguson, W.	Mankato	5	5
Glaeser, E. W.	Norwood	3	11
Goetzman, C. J.	Winona	1	19
Hanson, H. P.	Nelson		23
Hanson, Henry	Thief River Falls		14
Harris Bros.	New Ulm, R. 5	1	14
Hermanson, Martin J.	Utica	4	17
Holte & Son, H. O.	Shelly	2	16
Hughes, Roy O.	Mora	3	10
Husser, Henry	Minneiska	4	18
Hutchinson, E. O.	Sleepy Eye	6	4
Jensen, L.	Clearbrook	20	2
Jepson, C. M.	Zumbrota	8	15
Johnson, Gust A.	Garfield		13
Klockmann, C. L.	Withrow	4	16
Kroehler, Geo. J.	Henderson	2	19
Lambert, Alfred	Bronson	3	27
Lange, Wm.	Glencoe	7	18

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MINNESOTA—continued.			
Lindgren, J. L.	Wadena	18	2
McCall, J. G.	Austin	2	30
Mainz, Simon	Hastings		23
Malmquist, A. O.	Grove City	12	4
Marshall, Ed.	Bagley		10
Mattson, L. E.	Dassel	5	6
Von Mehren Bros.	Hinckley	3	12
Merickel & Nelson	Eagle Bend	55	
Mesenbring, Hilton	Young America	2	28
Mesenbring, Otto	Glencoe	3	28
Mohrenweiser, H. C.	Wahkon		17
Moldenhauer, E. A.	Elk River	15	
Morrison, A. E.	Copas	11	20
Moses, L. H.	Lake Crystal		10
Mosher, John	Claremont		39
Munroe, G. A.	Border		10
Nelson, Arthur C.	Lake Crystal	4	7
Nelson, E. H.	Glenville	3	27
Nelson, H. W.	Mankato		29
Nelson, Olaf	Alexandria		13
Ness, M. C.	Glenville	5	16
Neuman, O. H.	Glenwood	10	15
Nordling Bros.	Hallock	1	16
Norman, H. G.	Lake Crystal	6	4
Norman, Hugh	do	4	9
Olstad, Carl	Hanska	20	6
Oster, P. A.	Farmington		24
Palmer, P. P.	Goodridge		10
Patchen, Frank	Anoka	5	24
Paulson, O. C.	Peterson, R. 2		33
Peterson, T. P.	Blooming Prairie	6	13
Pfeiffer, Paul	Dover	16	19
Pool, C. M.	Farmington	2	19
Pope, Henry	St. Hilaire	13	13
Putnam, H. A.	Battle Lake	1	61
Putnam, S. T.	do	1	26
Putrah, B. L.	Good Thunder	1	49
Reibe, Herman	Winona	1	18
Roberts, Willard	Lake Crystal	2	11
Rodli & Wykel, Drs.	Albert Lea		27
Rouse, C. O.	Lakefield	20	3
Sandberg, A. P.	Hazel	1	15
Sausen, Jos.	Wyoming	7	11
Schelin, Chas. F.	Nelson		16
Sharp, George C.	Amboy	5	13
Sheldon, A. L.	Grand Rapids		20
Sheldon, L. J.	Waseca	4	34
Sherwood, Geo. E.	Kimball	7	20
Simon, Peter	Winona	14	28
Smith, C. H.	Brainerd		12
Smith, Nels, & Sons.	Winona		24
Solum, A. L.	Alexandria		20
Sprague, E. A.	Caledonia	1	29
Steele, Henry F.	Alden	3	15
Stems, George	Thief River Falls		20
Stenberg, Julius	Stillwater	6	15
Stibal, P. P.	Biscay		16
Stoll, Louie	Mora	34	1
Tenny, D. D.	Crystal Bay	29	
University of Minnesota, demonstra- tion farm and station.	Grand Rapids	9	53
University of Minnesota Dairy Farm	St. Paul	12	
Urdahl, Osmund	Goodridge	3	20
Volker, Thomas	Winona		14
Vollrath, Aug.	Plummer	1	16
Wagner, George	Goodridge		10
Walters, M. H.	Dexter	2	12
Watts, Frank E.	Mankato	3	16
Webb, Chas. P.	Medford	10	18
Whitney & Lind	Alden	1	44
Whitney & Nyberg	do		17
Wicken, J. O.	Garfield		20
Wiggins, C. H.	Lake Crystal	3	8
Willard, R. G.	Good Thunder	1	14
Wilson, Samuel B.	Mankato	11	17
Winkjer, Theo. G.	Garfield		23
Wollan, Anton M.	Starbuck	2	21
Zschetzsche, Arthur P.	Sleepy Eye	3	13

Tuberculosis Eradication under the Accredited-Herd Plan. 11

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MISSISSIPPI.			
Gayoso Farm.....	Horn Lake.....	20	83
Guernsey Stock Farm.....	Brookhaven.....	9	23
MISSOURI.			
Carter, Samuel M.....	Cape Girardeau.....	7	.....
Cologna, Peter, & Sons.....	Marshfield.....	40	43
Daniels, Frank.....	Vandalia.....	21	2
Dirmberger, Joseph A.....	Oran.....	10	9
Ellis, Joseph.....	Commerce.....	8	38
Exler, Benj. F.....	Cape Girardeau.....	2	10
Haupt, Charles H.....	do.....	5	23
Haupt, M. L.....	do.....	2	13
Hobbs, J. C.....	do.....	2	11
Masterson, D. E.....	do.....	1	15
Mehrle, John.....	do.....	5	10
Meyer, L. S.....	Springfield.....	23	27
Miller, I. Ben.....	Cape Girardeau.....	6	.....
Reiman, C. H.....	Egypt Mills.....	2	13
Rubel, Jacob D.....	Cape Girardeau.....	2	15
Weiss, C. W.....	do.....	17	19
Weiss, E. H.....	do.....	1	18
MONTANA.			
Fitzgeralds, M. D.....	Stevensville.....	5	27
Martin, Fred.....	Butte, R. I.....	3	12
Randles, J. W.....	Stevensville.....	5	11
NEVADA.			
Roesbery, S. D.....	St. Thomas.....	.....	10
NEW HAMPSHIRE.			
Clark, Geo. C.....	Charlestown.....	20	.....
Gilbert, A. W.....	Croydon.....	6	8
Hulburt, C. H.....	Peterboro.....	5	.....
Pierce, Arthur J.....	Bennington.....	36	.....
Trachier, Elsid.....	Hanover.....	4	12
NEW JERSEY.			
Hope, Joseph L.....	Madison.....	156	.....
Kean, Hamilton F.....	Elizabeth.....	15	.....
LaMonte, George, Estate.....	Boundbrook.....	8	.....
LaMonte, George M.....	do.....	28	.....
Lippincott, N. W.....	Swedesboro.....	16	.....
Salisbury, Henry A.....	do.....	9	.....
NEW YORK.			
Adsit, J. Leonard.....	Baldwinsville.....	15	.....
Alexander, W. A. & R. A.....	Union Springs.....	36	.....
Baron de Hirsch Agricultural School.....	Peekskill.....	2	22
Boggs, N. T.....	Woodstock.....	6	7
Brown, T. F.....	Clymer.....	12	17
Buck, LeRoy A.....	Groton.....	20	.....
Buckley, A. G.....	Valley Falls.....	33	13
Buckley, H. H.....	Oneonta.....	15	.....
Bull, Dr. E. L.....	Ithaca.....	9	.....
Burdick, Wynter.....	Greenwich.....	14	.....
Cadwell, E. B.....	Saugerties.....	24	.....
Carman, G. W.....	Trumansburg.....	9	3
Charlton Industrial School.....	Ballston Lake.....	5	14
Clark, E. S.....	Cooperstown.....	13	118
Coggeshall, L. L.....	Locke.....	41	.....
Douglas, Mrs. Elizabeth.....	Tilly Foster.....	34	.....
Fairweather, Charles S.....	New Lebanon.....	11	22
Farnam, Merritt.....	Ira.....	15	5
Ferns, Ceylon C.....	Fly Creek.....	9	.....
Gildersleeve, F. P.....	Union Springs.....	11	.....
Gratwick, W. H.....	Linwood.....	35	.....
Herbert, Preston.....	Briarcliff Manor.....	6	3
Hewes, E. B., & Son.....	Mayville.....	38	.....
Howe, H. W.....	Bedford Hills.....	34	.....
Hunter, J. H.....	Valley Falls.....	49	.....
Johnson, M. E.....	Jewett.....	11	8
Keenan, M. G.....	Oneonta.....	22	1

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NEW YORK—continued.			
Kingsland, W. G.	Goshen	27	
Kinney, O. F.	North Chatham	42	
Lamont, Henry	Cobleskill	28	1
McFee, Frank	Oneonta	27	
MacKenzie, Alex.	Glen Spey	19	
Macy, V. Everett	Ossining	35	
Mackey, Clarence H.	Roslyn	72	4
Mahoney, W. D.	Averill Park	13	1
Minard, W. W.	Kings Ferry	11	
Morgan, S. W.	Poplar Ridge	9	
Morse, A. D.	Jewett	11	11
Ogden, J. E.	Mountainville	19	
Packer, A. E.	Milford	10	15
Payne, Edgar S.	Penn Yan	16	1
Peck, C. A., & Son	Hensonville	6	14
Petteys, John S.	Greenwich	24	
Prouty, Dallas E.	Fort Ann	10	
Purdy, W. H.	Venice Center		16
Rhodes, O. M.	Etna	31	
Rickard, John H.	Richfield Springs	11	13
Sherman, Dr. F. J.	Ballston Lake	5	
Savage, John	Ithaca	5	16
Seaman, James H.	Glens Falls	21	
Smith, Frank M.	Springfield Center	39	
Ten Eyck, Peter J.	Voorheesville	15	
Thayer, W. J.	Cooperstown		10
Torsleff, L. F.	Union Springs	10	5
Trask, A. O.	Rock Rift	47	
Turner, C. M.	Schuyler Falls	18	
Tabor & Mignin	Castile	40	
Toan, Lewis A.	Perry	35	8
Whitaker, N. L.	Fulton	25	
White, L. S.	Cairo	38	
Wilbur, F. Fellows	Stillwater	12	
Worrall, C. W.	Goldenbridge	16	1
NORTH CAROLINA.			
Archie, J. S.	Davidson	8	5
Baird, J. O.	Asheville, R. 1.		19
Bernhardt, G. M.	Salisbury, R. 3.	3	15
Burke, E. S.	Winston-Salem	1	8
Clarida, W. F.	Greensboro		14
Conrad, Vance E.	Winston-Salem, R. 7.	1	9
Correll, W. G.	China Grove, R. 1.	2	4
Davis, W. N.	Gastonia	4	12
Fleming, W. C.	Greensboro	2	10
Garrison, T. J.	Weaverville, R. 2.		27
Gillelan, C. H.	Woodleaf, R. 1.	2	6
Goodman, C. J., & Sons.	Concord, R. 2.	7	46
Hagler, W. H.	Concord	3	9
Hardin, Thos. D., & Sons.	Greensboro, R. 5.	15	30
Harrison, J. M.	Mount Ulla	3	15
Harrison, J. S.	China Grove	4	7
Hodges, R. G.	Kinston, R. 3.		36
Hutchinson, J. C.	Charlotte	2	17
Kendrick, E. L.	Gastonia	3	5
Link, W. H.	Mooreville	4	3
Linville, E. C. B.	Winston-Salem	3	3
Luther, T. C.	Candler		10
Miller, S. W.	Mount Ulla	6	1
Rowan Guernsey Farm (Inc.)	Salisbury	38	
San Hill Farm Life School	Vass	9	5
Sanford & Cartner	Mocksville	8	9
Stabler, S. S.	Salisbury		10
Stoltz, H. J.	Winston-Salem, R. 7.	1	16
NORTH DAKOTA.			
Glick, L. S.	Minot	2	13
Indian School	Wahpeton	2	15
Kummer, Nick	Walcott	2	12
Lind, Geo.	Neche		11
Linn, S. L.	Hope	1	17
Molyneux, Perry	Grace City	6	8
Smith, P. P.	Shenoyenne	11	16
Spires, O. K.	Burlington	12	12

Tuberculosis Eradication under the Accredited-Herd Plan. 13

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO.			
Allen, H. M.	Troy	39	4
Allwordt, Martin	Gibsonburg	13	
Armstrong, F. S.	Elkton	4	3
Baker & Schumacher	Hiram	3	3
Bettman, Irwin	Silverton	7	3
Bingham, E. L.	Rutland	1	6
Bower, Elmer	North Canton	1	4
Brown, Armstrong	Apple Creek	1	9
Brown, Dr. Harry	Blacklick	7	11
Campbell, C. H.	St. Clairsville	7	
Cobourn, A. G.	Greenford	13	
Circle "W" Farm	Gates Mills	34	
Conkle, C.	Layland	20	
Cope, Roy E.	Leetonia	10	
Cunningham, B. L.	Pataskala		12
Engle, E. G.	North Benton	16	
Floding, Fred W.	Leetonia	16	
Hast, A. W.	Berlin Heights	11	13
Huffine, O. P.	Van Wert	17	
Jackson, Champ	Lake	15	3
Keller, Ira	Prospect	6	2
Kreider, John F.	Ohio City	5	5
Licking Creamery Co.	Newark	24	
Lyle, James D.	St. Clairsville	4	6
McBane, W. S.	East Liverpool	14	
McCammon, H. C.	Lisbon	23	5
McConnell, C. Miller	West Salem	20	
Martin, Joseph	Monroeville	1	19
Myers, V. R.	Rockford	1	4
Newman, Walter	Jefferson	6	2
Painter & McPeck	Hanover	5	10
Palm, Charles	Bellville	1	17
Patton, Jay B.	St. Clairsville	7	6
Rummel Bros.	Medina	17	
Shantz, John	Morral	32	1
Shoemaker, W. A.	Dayton	1	17
Siniff, G. L.	Ohio City	15	
Steiner, Emmitt	Orrville	29	
Steiner, Ivan	Wooster	13	
Tarbet, E. E.	Bellaire	7	9
Telling-Belle Vernon Co.	Willoughby	10	63
Treat, H. W.	Tallmadge	6	24
Warrington, Thos. C.	Salem	8	
Wilderson, C. G.	Leetonia	36	1
Williamson, A. B.	Greenford	5	4
Williamson, R. R.	Pataskala	7	
Winwood, G. W., jr.	Springfield	1	16
Zeis, Floyd	Tiffin	14	2
Zellar, John	Hanoverton	3	5
OKLAHOMA.			
Purviance, J. A.	Guthrie	1	35
OREGON.			
Anderson, Halmar	Blind Slough		15
Beckman, H. F.	Sherwood	6	
Curry, A. B.	Hillyard	5	
DeJong, Mary	Blind Slough		40
Elmer, Sam	Mulino	7	10
Hawley, C. L.	McCoy	17	
Stangel, Frank H.	Sherwood	6	3
Voget, Octav	Hubbard	8	
PENNSYLVANIA.			
Anderson, John O.	Mercer, R. 1.	2	17
Archer, Miss Caroline	Reading, Flying Hill Farms	28	5
Artman, Mrs. E. E.	Pulaski, R. 62		10
Beeman, S. C.	Brookville, R. 4	8	18
Bowman, John L.	Stillwater, R. 1.	6	1
Bowman, J. W.	Millville	8	
Brenner, B. F.	Rochester, R. 1.		17
Brobst, Chas. & Lloyd	Bloomsburg, R. 1.		14
Brown, Earl W.	Titusville, star route.	3	12
Burnham, Robt. C. & R. M.	Strattonville	6	5
Butler, O. W.	Wellsboro		15
Colton, J. B.	Carlton	9	26

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
PENNSYLVANIA—continued.			
Coulter, M. G.	Grove City, R. 16		10
Covert, A. M.	Evans City	5	4
Craig, T. H.	Sligo	6	13
Cullum, J. Barlow	Reading, R. 2	14	4
Dickey, Robert.	Slippery Rock, R. 2	6	7
Emmons, Louis C.	Swarthmore	23	
Evoy, Chas. H.	Rushland, Sleepy Hollow Farm	8	
Fergus, Hugh.	Slippery Rock, R. 2, Amity Farm	11	7
Ferguson, R. H.	Kirkwood	16	2
Flory, W. Bradford.	East Stroudsburg	8	6
Fox, J. M.	Foxburg, Mansion Farm	30	
Freshcorn, C. A.	Zelenople, Maple Grove Farm	12	
Fullerton, C. Dale.	Edinburg, R. 2, Maple Lawn Farm	9	12
Fullerton, James N.	Edinburg, R. 2	3	20
Gable, Lowell.	Wyebrooke	23	
Gernert, Spencer	Columbia Cross Roads, R. 3	20	
Graybill, A. S.	Bird in Hand	19	
Grimes, M. J., & Bro.	Catawissa	23	2
Groff, Chas. A.	Skippack	8	
Haines, Wm. J.	Blue Bell, Cherry Hill Farm	10	4
Hall, Harry G.	Stewartstown	1	43
Hartenbach Bros.	Manaca	6	9
Hartman, Charles.	Gratz		16
Harvey, A. F.	Titusville, R. 3, Shelmedine Dairy Farm	1	33
Hughes, J. N.	Mercer, R. 1	3	15
Hurley, Wm. W.	New Hope, R. R., Hurley-Hurst Farm	16	
Hyde, T. E.	Bloomsburg	5	
Ikeler, J. Harold.	Millville	12	8
Indiana County Home.	Indiana		14
Jones, Mrs. K. M., Ammerman, R. S., & Jones, H. P.	Danville, R. 1	6	14
Kline, Blake E.	Orangeville, R. 1	1	13
Kline, J. Frank.	Bloomsburg, R. 6	9	
Little, P. J.	Ebensburg	20	11
Longwood (Inc.), Malcolm Farquhar, manager.	Kennett Square	20	9
Luden, Mr. & Mrs. W. H.	Reading, Riviera Farm	30	1
Maule, E. & Co.	Westgrove	27	29
Maule, Edwin B.	Coatesville, R. 5, Sunnybank Farm	37	
McFarland, M. E. & R. B.	Pulaski, R. 62		12
Mensch, Frank.	Bloomsburg, Valley View Farm	8	
Miller, J. E.	Rohrsburg, Lone Oak Farm	1	20
Mitchell, B. B.	Troy	29	6
Naylor, F. L.	Jackson Center, R. 19	1	12
Oesterling, Lewis	Butler, R. 2	5	10
Ogden, John C.	Johnstown	63	
Paden, Milo D.	Poland, Ohio, R. 1	6	3
Patterson, Geo. H.	Belle Vernon	8	6
Patterson, W. E.	Enon Valley	3	10
Pizor, F. W.	Mercer, R. 6	6	11
Phillips, M. T.	Pomeroy	60	3
Reed, C. E.	Slippery Rock, R. 5	1	11
Reefer, John.	Zelenople, R. 1	10	
Rider, J. L.	Catawissa, Pleasantview Farm	12	3
Ruckle, Stanley E.	Bloomsburg, R. 2	19	1
Shaffer, Miss J. Elizabeth.	Etters, R. 1	8	
Sherer, C. R.	Edinburg, R. 2	4	14
Shook, C. D. & C. F.	Spring Mills	21	
Smith, J. Iden.	New Hope, R. 1, Maple Knoll Farm	7	24
Smith, S. Wilfred.	Buckmanville, Pleasant Valley Farm	7	1
Tennant & Bradshaw	Slippery Rock	11	16
Thompson, A. A.	Uniontown, Oak Hill Farm	37	11
Thompson, A. E. & Son.	Grove City, R. 17	1	14
Thomson, Frank G.	Devon, Brookmead Farm	72	9
Townsend, S. W.	Cochranville	3	20
Trees, J. C.	Mars, Mapledale Farm	43	2
Tyson Bros. (Inc.).	Floradale	14	
Wachsmuth, C. A.	Butler, star route	5	3
Wells, Irwin I.	Fricks Lock	32	10
Whitehead, P. B.	Quakertown, R. 1	25	1
Worley, Clyde M.	Mercer, R. 2	10	
Wright, H. Greeley.	Canton, R. 2	3	19
Young, Ed. H.	New Castle, R. 6	2	12
Witherspoon, S. H.	Enon Valley, R. 1	1	10

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
SOUTH CAROLINA.			
Byers, J. M.	Rock Hill, R. 1	12	4
Ervin, J. M.	Darlington	6	27
Gettys, N. P.	Lugoff	10	58
Hoover, C. J.	Green Sea	2	15
James, A. L.	Darlington	23	4
James, K. M.	do.	7	12
Lemmon, W. C.	Elliott	1	38
Montgomery, L. F.	Bishopville	16	7
Mooneyhan, C. G.	Elliott		26
Pratt, R. M.	Bennettsville	6	2
Smith, R. A.	Lynchburg	13	19
Ware Shoals Manufacturing Co.	Ware Shoals	31	9
Wheeler, W. S.	Saint Charles	10	22
Zeigler, W. H.	Cope	1	10
UTAH.			
Allen, A. E.	Huntsville		10
Bartholomew, A.	Ogden		26
Clover Leaf Dairy, F. E. Bagley.	Murray	5	38
Cobley, A. E.	Pleasant Grove		13
Cowan, Jas.	Ogden		10
Cowan, John	do.		19
Howard, J. H., jr.	Woods Cross		13
VERMONT.			
Bicknell, H. W.	Norwich		22
Bisbee, B. D.	Waitsfield		18
Bliss, R. F.	Montpelier	1	5
Bradley, J. W.	Norwich		14
Bromley, Kent & P. D.	East Corinth	10	
Carpenter, H. M.	Moretown		41
Chamberlin, W. G.	Barre	2	24
Churchill, C. H., jr.	Pittsford		26
Collins, C. H.	Plainfield	12	28
Darling, W. F.	Groton	3	9
Davenport & Glidden	West Addison		25
Dodge, C. A.	Barre	5	34
Durivage, M. C.	Lowell		32
Elliot Bros.	Barton		40
Farrington, F. H.	Brandon	6	8
Foote, Charles H.	Burlington	21	
Gokey, F. N.	Plainfield		29
Goodwin, I. H.	Groton	4	15
Hall, I. N.	do.	7	34
Holbrook, F., Estate, Scott Farm	Brattleboro	5	10
Jones, F. C.	Saxtons River	7	11
Johnson, John, D. W. Blodgett, manager.	Montgomery Center		28
Keating, W. H.	West Lebanon		37
Kidder, F. Thomas.	Woodstock	11	17
King, Roy	Greensboro Bend		20
Kingsbury, T. W.	Cavendish		28
Kingsbury, H. S.	do.		14
Kingsley, Guy	Lowell		16
Lyons, E. M.	Barre	1	3
McDonald, Charles	Topsham	7	29
Miles, J. F.	East Corinth	3	3
Miller, J. D.	Groton	10	15
Moody, M. H., Meadow Farm	Waterbury	42	
Nelson, S. F.	East Ryegate	4	49
Perley, A. W.	East Berkshire		61
Phillips, T. R.	Montpelier	12	10
Sargent & Baird	Chittenden	33	5
Shumway, C. J.	Bradford	4	26
Skinner, D. H.	Waitsfield	22	10
Smith, David H.	Greensboro Bend	3	21
Smith, J. J. & Son	South Newbury	5	35
Stevens, Charles H.	St. Johnsbury	29	21
Story, George E.	Essex Junction		30
Varney, Howard & Son.	South Strafford		32
Vermont Marble Co:			
Reynolds Farm.	Proctor		62
Douglas Farm	do.		83
Goodno Farm	do.		85
Wark, Charles	St. Johnsbury	3	33

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Wedge, Mrs. M. E.	Grand Isle		16
Welch, Carlos B.	Barre		27
Welch, W. F.	Bethel		32
Whitman, Levi	Wells River		27
Wilcox, F. H.	Randolph Center		27
Wilder, L. O.	Middlesex	9	36
Woodbury, U. A., 2d	Burlington	42	
VIRGINIA.			
Adams, James.	Fairfax		34
Allison, L. M.	Remington		12
Ankers, M. A.	Sterling		15
Ashby, O. L.	Ashburn		13
Bailey & Dofflemoyer	Berryville		17
Birdsall, W. G.	Purcellville		20
Bispham, N. C.	Remington		60
Blount, W. E.	Bluemont		15
Boswell, H. E.	Burkeville		45
Bowen, M. J.	Mechum River		31
Braden, O. S.	Paeonian Springs	2	5
Branch, Harrison	Hamilton	1	14
Buhrman, A. W.	Abingdon	3	32
Clopton, J. K.	Remington		18
Curtice, Hosea	Fairfax	2	7
Day, C. F.	Catlett		10
DeKay, H. E.	Ashburn		43
Dellinger, O. C.	Woodstock	2	4
Dillon, J. D.	Purcellville	3	3
Farrar, W. B.	Burkeville		15
Ferneyhough, J. G.	Richmond		11
Flatten, G.	Norge		10
Gold, H. B.	Winchester		13
Gregg, E. B., & Son	Hamilton	2	39
Harrison, H. T.	Leesburg	8	
Hay, W. J.	Ashburn		10
Hess, J. R.	Leesburg	9	23
Hirst, E. H.	Purcellville	1	65
Hirst, Mrs. J. T.	do.		27
Hofferberth, C. A.	Ashburn	2	8
Humbert, J. L.	Charlottesville	5	2
Jones, Ben G.	Herndon		10
Keene, B. B.	Sterling		26
Kindig, C. D.	Waynesboro	3	10
Kirkpatrick, Edgar	Ashburn	1	35
Kirkpatrick, W.	do.		89
Lee & Coates	Leesburg	4	37
McSpadden, W. P.	Beaeton		13
Miller, M. E.	Vienna		14
Miller School	Crozet	4	147
Moore, Thos. L.	Rio Vista	1	58
Munday, L. W.	Vienna		18
Nash, W. T.	Remington		19
Nichols, J. V.	Purcellville	3	68
Nickell, R. B.	Herndon	1	34
Norman, W. F.	Purcellville		12
Olinger, J. P.	Remington		25
Pancoast, J. L.	Fredericksburg	1	38
Parrish, J. Scott	Drewry's Bluff	6	14
Patrick, N. R.	Rustburg	14	53
Peyton, W. D.	Fredericksburg		22
Pfalzgraf, A.	Fairfax		19
Presgraves, W. N.	Lincoln		16
Rawlings & Roller	Staunton, R. R.	12	26
Reid, Geo. W., jr.	Remington		22
Rice, C. T.	Oakton	16	17
Roller, E. C.	Staunton	3	17
Rosser, Thos. L., jr.	Charlottesville	9	
St. Joseph Institute	Bristow		18
Sandy, T. O.	Burkeville	2	57
Saunders & Myers	Leesburg	26	46
Saunders, W. D.	Ferrum		129
Sellers, W. A.	Burkeville	2	9
Shaffer, F. R. L.	Fincastle, R. 2	3	13
Shank, E. C.	Waynesboro	18	9
Showalter, M. I.	Harrisonburg		13
Stroud, M. K.	Herndon	9	11

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VIRGINIA—continued.			
Thompson, W. L.	Purcellville.		41
Wakeman, H. H.	Toms Brook.		13
Ware, Jas. T.	Rapidan.	4	51
Watkins, E. A.	Goldleaf.	1	1
Weaver, S. B.	Waynesboro.	2	9
Willis, M. H.	Fredericksburg.	3	2
Wilson, W. H.	Purcellville.		55
Wortman, C. T.	Ashburn.		19
Wortman, L. W.	do.	2	10
WASHINGTON.			
Ankeny, J. D.	Walla Walla.	5	
Bateman, H. W.	Bellingham.	8	
Douglas, H. B.	Ferndale.		42
Hansen, Martin.	Walla Walla.		28
Jacobson, Nels.	Lynden.	28	
WEST VIRGINIA.			
Allison, E. H.	Short Creek.		10
Barney, W. J.	Triadelphia, R. 1.		11
Bloch, J. A. & H. S.	Wheeling.	5	17
Bonar, G. W.	Short Creek.	11	12
Bonar, C. L.	do.		31
Bromer, L. W.	Wheeling, R. 2.		14
Cox, J. B.	West Alexander, Pa.	2	12
Dodds, John R.	do.		12
Emsley, J. E.	West Liberty.		14
Fischer, W. A.	Triadelphia.	2	16
Lewery, Wm. L.	Falling Waters.	2	10
McColloch, Wm.	Wheeling, R. 1.		10
McCombs, C. W.	Wheeling, R. 2.		16
McCoy, Geo. P.	Short Creek.	1	16
Milliken, J. P.	Triadelphia, R. 2.		24
Montgomery, W. D.	Triadelphia.	7	3
Orr, R. H.	Triadelphia, R. 1.	4	11
Pope, Charles.	Elm Grove.		17
Powell, D. H.	Triadelphia, R. 1.		11
Roth, Annie.	Wheeling, R. 2.		12
Ruble, Chas. W.	Falling Waters.	1	10
Thornburg, H. L.	West Alexander, Pa., R. R.	1	11
Wallace, Bros.	Elm Grove.		25
Whitcotton, Lester.	Triadelphia.	1	13
Winters, Nick.	West Alexander, Pa., R. R.		22
Wolf, E. O.	Wheeling, R. 2.	1	12
WISCONSIN.			
Adams, Geo. W.	Nashotah.	19	
Anderson, Guy C.	Ogdensburg.	10	15
Anderson, Theo. A.	Grand Rapids.	4	8
Andrew & Nelson.	Livingston.	11	
Arnold, Adolph.	Whitewater.		22
Bailey, Floyd.	Prescott.	14	1
Bamber, W. P.	Sparta.		14
Bandy, F. J.	Wausau.	20	
Basse, A. G.	Milwaukee.	14	4
Basse, W. H.	do.	12	5
Beckwith, J. R.	Barron.		17
Beglinger, Fred G.	Fisk.		20
Bennett, Mrs. A. F.	Eau Claire.	11	29
Berendsen, Bernard.	Phlox.	4	14
Berg, John I.	Holmen.		21
Berge, Anton O.	Valders.	15	11
Berge, Oscar G.	do.	9	12
Berge, Otis I.	do.	6	25
Bestul, M. J.	Scandinavia.	11	13
Bonsack, H. M.	Onalaska.	22	
Bloom, John.	Fisk.	12	
Breidenbach, J. G.	Marshfield.		6
Brown, Harry H.	Eau Claire.	20	24
Brown, Henry.	Holmen.		30
Browning, J. O.	Eau Claire.	3	7
Brubakken, Adolph.	Northland.		21

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Brunstad, G. A.	Chippewa Falls	6	32
Burhapp, Wm.	Marshfield	8	15
Burnham, D. F.: Farm No. 1.	Waupaca	3	27
Farm No. 2.	do		28
Butterfield, F. L.	Cornell	5	30
Cameron, Duncan M.	Chippewa Falls		20
Campbell, N. H.	Eau Claire	2	30
Cartwright, I. W.	New Auburn		10
Chapin, Ed.	Iola	21	
Christensen, Hans.	Cashton	22	
Christianson, W. R.	Hortonville		15
Clark, D. F., & Son	Poskin	27	24
Clark, Jay	Holcombe	2	28
Coombs, Ray	Troy Center	40	1
Cotton, J. T.	Chippewa Falls	3	13
Courteen, Sidney	Oconomowoc	44	
Cox, Harry I.	Whitewater		15
Danks, Dell	Stoughton	19	
Dawley, Dr. Geo. F.	New London		29
Dawley, Wesley	Cataract		13
Dawney, Theron A.	Bloomer		20
Dickson Bros.	Almena	3	22
Dietz Bros.	Hortonville	18	19
Dietzler, Chas.	Cadott		12
Duncanson, W. E.	Sparta		14
Engel, A. C.	Whitewater	12	27
Everit, August	Pewaukee	5	31
Ewings, M. C.	Wausau	12	8
Faltz, Philip	Dousman	5	25
Farrow, Turner A.	Oshkosh	6	28
Felland, J. E.	Mauston		19
Follstad, Anton	Elcho	10	
Footo Bros.	Rush Lake	12	7
Franciscan Nuns	Coon Valley	13	23
Frauenheim, O. R.	Random Lake	29	
Fried, Wm. J.	Fountain City	8	17
Gaubatz, Herman	Chilton	18	2
Gibson, C. N.	Eau Claire	1	27
Giese & McDonald	Stevens Point	14	11
Glazier, R. L.	Baraboo		13
Glocke, A. A.	Weyauwega	12	10
Goff, Moulton B.	Sturgeon Bay	28	
Graham, R. H.	Roberts	12	20
Guptill, R. P.	Elcho	20	
Haag, Julius	Malone	3	11
Haag, Wm.	Marshfield	16	4
Halbert, J. H.	Augusta	12	16
Hanchett, Wm. H., Farm No. 1	Sparta	26	5
Hargrave, A. W.	Ripon	20	5
Hargrave, R. O.	Roberts	13	2
Hargrave, W. E.	do	14	9
Harman, Wm.	Arkansaw	3	18
Harmeling, B. B., & Sons	Oostburg	7	18
Hass, Edwin J.	New Holstein	14	
Haugen, Ole	Stanley		19
Herbert, Harry	Ogdensburg	9	30
Herman, M. J.	Abbotsford		20
Hickcox, J. Gilbert	Whitefish Bay	31	5
Hill, P. W.	Arkansaw		26
Hill, Frank L.	Cadott		18
Holeton, R. C.	Wausau		11
Hoppert, Chris.	Sheboygan	9	19
Hotz, E. A.	Scandinavia		32
Humphrey, Evan	Sparta	4	17
Huser, E., & Son	Cumberland	7	20
Ingalls, G. R.	Eau Claire	20	7
Jacklin, B. A.	Waupaca	20	9
Jacobson, Carl J.	Scandinavia		16
Jamison, R. C.	Appleton	12	5
Joch, Chris., & Son	Weyauwega	4	18
Johnson, Alfred	Cataract	5	10
Johnson, C. H.	Unity	3	22
Johnson, G. A., & Sons	Ogdensburg		20
Johnson, James M.	Lavalle		21
Kersten, Frank R.	Janesville	7	9
Kickbusch, Paul	Wausau	15	9

Tuberculosis Eradication under the Accredited-Herd Plan. 19

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Kiel, Geo. W.	Manitowoc	20	
Knapton, Geo. H.	Marshfield		24
Knudson, Emil	Holmen	2	10
Koehler, H. A.	Dousman	3	10
Krings, Thomas	Arkansas		18
Langdell, S. C.	Eau Claire	18	12
Larimer, Norman G.	Blue River	16	
Larson, Michael, jr.	Northland	4	14
Laurence, A. W.	Sturgeon Bay	19	5
Lawson, Geo. D.	Oconomowoc	9	
Lawson, Wilbur	Rosendale	19	6
Lee, Ludwig L.	Holmen	31	6
Lewis, Ray	West Salem	22	1
Liebzeit, Albert	Greenwood	11	18
Loether, E. J.	Holcombe	13	
Lohrenz, Edw., & Sons	Hortonville	11	15
Lonsdorf, Wm.	Athens	5	17
Lovejoy, Hiram D.	West Salem	31	
Lueders, Albert	Reedsburg	8	
McCarthy, Wm.	Limeridge	12	15
McDonald, Robt. K.	Stevens Point	21	
McKerrow, Geo., & Sons Co.	Pewaukee, Farm No. 3	14	
Madison, Henry	Oshkosh		20
Malin, A. J.	Genoa	15	6
Malin, John C.	do	3	13
Malin, Mrs. M.	do	9	14
Maule Brothers	Secherville		20
Mayer, Christian	Chilton	3	14
Meltz, Emery C.	Appleton	24	
Milner, Geo. F.	Baraboo	6	6
Morner, Arvid	Prentice	5	7
Muench, Andrew	Bloomer	2	21
Mueller, Philip H.	Almena	3	23
Munn, Dr. W. A.	Janesville	35	
Mytton, Frank	Wittenberg		11
Nelson, John	Cadott	4	28
Neison, John A.	Barron		35
Nelson, Wm.	Oshkosh	4	29
Nordbye, Carl C.	Amherst Junction	3	20
Nygaard, P. P.	Scandinavia	3	25
Oleson, A. O.	Livingston	32	1
Oleson, Otto	Westby	12	22
Olson, Carl C.	Holmen	2	26
Olson, Mrs. S. B.	Elderon		12
Onsrud, Ben A.	Stoughton	12	11
Ora, H. F.	Manawa	11	6
Overton, R. K., & Son, Farm No. 1	Beloit	9	12
Pace, C. W., & Son.	Mondovi	24	10
Pansie, Geo.	Fisk	1	15
Pattee, J. R.	Markesan	10	8
Pattee, W. D.	Waupun	21	9
Peik, Carl J.	Chilton	6	20
Peterson, Arthur H.	Nelsonville	11	1
Peterson, P. T.	Medford	8	3
Phillips, Edward	Chippewa Falls		19
Queen, P. A.	Scandinavia		21
Rather, Armand P.	Peebles	32	
Reis, Jos.	Athens		16
Reitz, Geo. L.	do	15	12
Reitzow, Robt. A.	Edgar	8	4
Rice, C. C.	Northland		10
Rice, Ernest E.	Ogdensburg		13
Ritland, Carl	Chippewa Falls	9	11
Rockwell, C. E.	Whitewater		13
Roman, F. E.	Weyauwega		16
Ross, Joel W.	Oshkosh	16	23
Ruelke, Chas.	Ogdensburg	5	17
Runde, Frank	Sinsinawa	22	17
Rundell, Dale E.	Livingston	68	
Rundel, Homer F.	do	85	6
Rupple, S. G.	Medina	3	12
Sandman, Wm. D.	Holmen	18	22
Sauberlich, T. H.	Appleton		27
Sawyer, Edgar P.	Oshkosh	23	
Saxe, Claire R.	Mondovi		22
Saxe & Bourget	do	2	28
Schaude, Edwin J.	Whitewater		11

GUERNSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Schantz, Jos.	Sparta	10	
Schmidt, Otto.	Northland		11
Schmit, Chas.	Hortonville	4	21
Schneider, Chas.	Cadott	3	20
Schneider, John	Dousman		14
Schroeder Bros.	Antigo	5	28
Schroeder, Frank	do.	2	41
Schwartz & Williams.	Troy Center	18	4
Setzer, John F.	Hillsboro.	2	21
Smith, Moses	Catact		15
Solberg, E. C.	Sparta	5	17
Stockwell, W. J., & Son	Holcombe.	2	12
Strodthoff, Herman.	Manitowoc	9	25
Strong, Chas. G.	Chippewa Falls		40
Stroupe, G. W.	Whitewater.	5	12
Taggart, W. H.	Manawa	28	34
Tarr, C. M.	New Auburn		20
Thompson, Adolph.	Wausau.	15	2
Thompson, Carl.	Westby.	5	17
Tift, J. R.	Elk Mound.	35	
Tilden Farms.	Delavan	145	84
Wagner, J. B.	Potosi.	3	22
Weeks, John M.	Chilton.	3	16
Weiler, Peter	Athens.		20
Welles, M. L.	Rosendale.	55	2
Wendorf, Albert.	Shawano.	22	1
West, Pone N.	Waupaca.	4	23
Weller, Wm.	Unity.		16
Whitcomb, E. R.	Milwaukee, Station C	23	8
Wichern, L. M.	Baraboo.	10	8
Wild Bros.	Elmwood.	15	20
Wiley, J. M.	Holmen.	8	29
Williams, H. B.	Bear Creek.	5	18
Williams, W.	Sparta.	7	22
Woodard, O. C.	Weyauwega.		19
Wroldstad, M. J.	Northland.	8	27
Zempel, Robt.	Weyauwega.		11
Zielke, Wm.	Oshkosh.	4	17
Total (Guernsey, United States)		8,849	13,921

HOLSTEIN-FRIESIAN.

ALABAMA.			
Baker, W. B.	Birmingham, R. R.	1	103
Alabama Technical Institute for Women	Montevallo		63
Black & Barclift	Vincent		55
Edwards, A. B.	Selma	3	11
Kirkpatrick, C.	do.	1	22
Morris Bros.	Opelika	1	29
Odd Fellows' Home	Cullman	1	25
Sarber, I. E.	Elmore	2	18
St. Bernard College	Cullman	1	24
Wilson, A. H.	Opelika		28
ARKANSAS.			
Trustee, A. H. Endowment	Jonesboro	28	
Nicholson, J. F.	Bentonville	6	10
University of Arkansas	Fayetteville	10	
COLORADO.			
Pahgre Valley Ranch Co.	Montrose	28	
CONNECTICUT.			
Bissell, Arthur G.	Suffield	27	1
Calhoun, J. E.	New Milford		54
Cheney, Asa	North Grosvenor Dale		10
Hall, Gardiner, jr., & Co.	South Willington	41	
Hollister, Burr A.	Washington	15	
Hopkins, J. E.	Thomaston	8	17

Tuberculosis Eradication under the Accredited-Herd Plan. 21

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
CONNECTICUT—continued.			
Hoxie, Fred.....	Lebanon.....		20
Keach, G. L.....	Woodstock Valley.....		21
King, Mrs. C. H.....	New Preston.....	16	
Lyman, John G.....	Norwich.....		17
Munyon, Ira E.....	Thompson.....		15
Peasley, F. M.....	Cheshire.....	23	
Peterson, John A.....	Pomfret Center.....		13
Town Farm.....	New Britain.....	6	6
DELAWARE.			
Armstrong, B. V.....	Middletown.....	6	9
Gruwell, Cooper.....	Felton.....		16
Hall, John.....	do.....		11
Insole, Herbert W.....	Townsend.....	4	11
Jarrell, Alvin.....	Felton.....		14
Jester, Walter.....	do.....		17
Jester, Willard.....	Harrington.....		10
Lewis, J. Edwin C.....	Dover.....	5	
Schabinger, J. H.....	Felton.....	14	
DISTRICT OF COLUMBIA.			
Convent of Visitation.....	Thirty-fifth and Q Streets, George- town.....		16
Franciscan Monastery.....	Brookland.....	1	10
Home for the Aged and Infirm.....	Blue Plains.....	15	
Markham, Edward.....	Twenty-first Street and Bennings Road NE., Washington.....		14
Mayhew, L. E.....	Twentieth and C Streets NE., Wash- ington.....		32
Orrison, John A.....	Brightwood.....		17
Pyles, Samuel J.....	Grant Road, Chevy Chase.....		11
Tenley, Albert.....	Shepherd Road, Brightwood.....		17
Wahler Bros.....	Wheeling Road, Congress Heights, Washington.....		17
FLORIDA.			
De Bevoise, J. C.....	Jacksonville, R. box 326.....	14	22
Estate of A. Swanson.....	Miami.....		23
Gailbreath, C. S.....	De Land.....	4	19
Glover, T. B.....	Jacksonville, R. 3, box 216.....	1	45
Harris, C. G.....	2225 Boulevard Avenue, Jacksonville.....		18
Ives, M. C. & Co.....	Ojus.....		55
GEORGIA.			
De Renne, W. W.....	Box 481, Savannah.....	7	5
Georgia State Sanatorium.....	Milledgeville.....	8	80
Lane, Mills B.....	Savannah, R. "B".....	48	
Lay, H. G.....	Calhoun.....	7	15
McGarrah, Sam.....	Americus.....		39
Schurene, J. W.....	Calhoun.....		22
State College of Agriculture.....	Athens.....	19	
United States Penitentiary Farm.....	Decatur, R. 3.....	7	44
IDAHO.			
Anderson Bros.....	Rexburg.....		13
Aldred & Hansen.....	Weiser.....		18
Ashley, A. J.....	Paris.....	8	
Asbury, G. W.....	Weiser.....		12
Boomer, H. R.....	New Plymouth.....	25	
Boesieger, Anton.....	Shoshone.....		21
Barney, Will.....	Lewisville.....	2	15
Boss, C. E.....	Rogerson.....		13
Beail, S. G.....	Payette.....		28
Boise High School Farm.....	Boise.....	1	24
Baer, Albert.....	Eagle.....	4	42
Brown, R. D.....	Winchester.....		15
Brown Bros.....	Liberty.....	31	3
Clark & Hastings.....	Castleford.....		15
Cleary, M. C.....	St. Maries.....	3	49
Covington, E. T., & Son.....	Rexburg.....		36
DeMyers, Edward.....	Boise.....		17
Dickerson, T. L.....	Rosewell.....		17
Ducommun, John.....	St. Maries.....		28

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
IDAHO—continued.			
Ducommun, Steven	St. Maries		44
Douglas, G. H.	Meridian	5	8
DeVerel, W. T.	Cocolalla		17
Davis, R. T.	Weiser	5	6
Eberle, Herbert	Boise		15
Frabrisus, Hans	Hansen		18
Fonley, S.	Kimberly	4	3
Girshman, S. C.	Kuna		10
Gieseke, L. F.	Shoshone		10
Gage, Mrs. R. G.	Dietrich		15
Green, V. A.	Buhl	1	21
Gurnea, L. H.	do.	7	5
Gishall, F. A.	St. Maries	1	12
Hastings, F. W.	Wendell	10	1
Hendricks, Jas.	Rexburg	2	10
Hymas, Alfred	Liberty		15
Hymas, Joseph	do		18
Hymas, B. P.	do	1	28
Idaho State Penitentiary	Boise		27
Icarcello Bros.	Rathdrum		11
Intermountain Institute	Weiser	52	8
Johnson, R. K.	Gooding	2	13
Johnson, Carl E.	Idaho Falls	18	49
Jensen, J. E.	Sugar City	2	6
Jones, Walter	Idaho Falls		15
Jackson, Henry	Meridian	1	23
Knight, S. G.	do.		34
Kyle, E. E.	Post Falls		13
King, L. L.	Kuna		19
Krieh, C. H.	Buhl	26	
Keller, A. H.	Boise		15
Kootenai Fruit Growers' Association	McArthur		30
Lewis, W. L.	Kuna		15
Lilligard, Chris	Boise		18
Miller & Snyder	do		19
Murphy, Geo.	St. Maries	1	9
Murphy, G. G.	Dietrich	1	13
May, John	Granite	5	2
Mariner, C. E.	Hagerman	6	17
Mariner, C. F.	do	1	10
Nelson, David	Dietrich		12
Nelson, J. N.	Filer	6	8
Nettisheim, C. W.	Rathdrum	2	3
Padgham, H. A.	Gooding	4	12
Palmer, F. L.	Dietrich		11
Pratt, M. A.	Jerome	5	10
Perrette, J.	St. Maries		23
Poulsen, W. E.	Liberty		22
Pincock, Geo. A.	Sugar City	9	5
Randall, C. C.	Idaho Falls		12
Rea, J. A.	Kuna	2	10
Rigby, D. E.	Sugar City	2	16
Ricks, Orson	Rexburg	2	10
Rowell, V. A.	Boise		13
Records, Alfred	Eagle	2	12
Rogers, M. A.	do	5	26
Rocket, Mark	St. Maries		17
Rhodehouse, J. W.	Parker		14
Rippeteau, J. A.	Rathdrum	13	4
Roberts, R. M.	Wendell		10
Roch, G. A., & Sons	Caldwell	4	14
Schuler, Alois	New Plymouth	21	3
Sandgren, N.	Buhl		12
Swanson, F. A.	Boise		17
Stevens, O. H.	Caldwell		12
Streit, Mrs. R.	St. Maries		15
Shriner, Frank	Weiser	2	13
Scofield, Ernest	St. Charles	5	
Stone, Stanley	Gooding		15
Suing, H. P.	Careywood		47
Smith, R. C.	Gooding		13
Trigg, C. W.	Post Falls		11
Towne, Ira H.	Dietrich		15
Thomas, W. B.	Jerome	1	10
Weirich, H.	Wendell		17
Wachow, H. J.	Idaho Falls	14	3
Walbank, R. P.	Kuna	22	2
Wheeler, L. M.	Boise, R. 4.		10

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
ILLINOIS.			
Benton, Sidney.....	Stockton.....	11	15
Byers, J. W.....	Mason.....	2	5
Bischan, P. C.....	Monee.....	17	
Boltenstern, Theo.....	Cambridge.....	1	14
Braun, Hy.....	Hecker.....	1	8
Bridgeland, J. B.....	Winnebago.....	5	14
Buzzard, A. L.....	Metamora.....	8	1
Coe, Wilbur.....	Quincy.....	7	5
Country Home for Convalescent Chil- dren.....	West Chicago.....		13
Craver, Glen.....	Mason.....	4	7
Elsbury, Elbert.....	Gurnee.....	10	7
Fitsche, Mrs. M.....	New Douglas.....	6	5
Foss, Chas.....	Cedarville.....	15	5
French Bros.....	Shipman.....	57	
Galt, Paul T.....	Sterling.....	16	
Gehrig, A. W.....	Alhambra.....	11	2
Gehrig, S. E.....	New Douglas.....	17	
Grab, George.....	Shumway.....	12	
Grosenheider, J. H.....	Alhambra.....	13	
Hanabarger, O. M.....	Coffeen.....	12	4
Haseley, Albert.....	Effingham.....		10
Heckle, Albert.....	Quincy.....	4	9
Heidenreich, Ralph.....	Woodbine.....	1	21
Henderson & Low.....	Hopedale.....	35	45
Herndon, I. C.....	Fairbury.....	12	
Herrin, J. A.....	Olney.....	14	
Hogelshofer, H. A.....	Dakota.....	11	12
Howe, Quincy.....	Winslow.....	8	
Hunt, H. H.....	Ottawa.....	2	21
Iliff, Robt.....	do.....		18
Jenuine, Harry.....	Montrose.....	7	
Johnson, Sophie.....	New Douglas.....	8	
Jordan, T. N.....	Urbana.....	1	11
Krahman, Bernard.....	Effingham.....	22	
Lanus, W. C.....	Montrose.....	21	26
Likens, Grant S.....	Orangeville.....	1	5
Likens, Stephen T.....	do.....	1	12
Lisle Farm Co.....	Lisle.....	120	
Livingston, Wm. O.....	New Douglas.....	11	4
Loy, Wood.....	Effingham.....	12	17
McLean, Alex.....	Ottawa.....		16
Marten, Chas.....	Effingham.....	7	4
Marten, Sam.....	do.....	13	
Mecay, Rufus.....	Ottawa.....		12
Melm, Henry.....	New Douglas.....	17	
Melm, Wm.....	do.....	9	4
Mohme, Paul.....	do.....	9	
Morain & Whitten.....	Irving.....	13	2
Moss, Ed.....	Paris.....	13	1
Nierstheimer, A.....	Pekin.....	29	10
Neuhauser, Amos.....	Eureka.....	15	7
Newman, Wm.....	Metamora.....	13	2
Nimmo, Geo.....	Fairbury.....	31	4
Norem, E. N.....	Ottawa.....	1	19
Oltmanns, John J.....	New Douglas.....	5	5
Peck Bros.....	Ottawa.....	4	20
Powell, C. E.....	Polo.....	25	3
Rathbun, J. K.....	Lombard.....	42	8
Roberts Holstein Co.....	Waterman.....	50	
Rosenthal, H. C.....	New Douglas.....	5	10
Schertz, Ben.....	Roanoke.....	14	13
Stephens, Chas. W.....	Ottawa.....		28
Stieglitz, J. P.....	Metamora.....	7	11
Straus, E. A.....	Glenwood.....	22	
Taylor Bros.....	Mason.....	3	18
Thomas, B. L.....	Ringwood.....	21	
Vermillion County Farm.....	Danville.....	1	16
Wade, A. S.....	Mason.....	2	7
Walter, Frank A.....	Orangeville.....	1	26
Wente, Ferd.....	Sigel.....	31	
Wente Bros.....	Teutopolis.....	3	20
Wetzel, J. H.....	Alhambra.....	3	8
Wolfe, Oscar W.....	Winslow.....	15	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
INDIANA.			
Bailor, Charles O.	Frankfort	7	7
Binhack, George	Princeton	2	14
Blinn, Walter	Marion	9	14
Busse, Walter	Aurora	2	15
Butler & Son, Leeburn	Newcastle	15	
Butler Bros.	Brazil	1	20
Campbell, Ross	Sullivan	11	3
Carney Bros.	Morristown	17	13
Cottingham, W. M.	Moores Hill		12
Eastern Indiana Hospital for Insane	Easthaven, Richmond	10	13
Edwards, J. E.	Booneville	20	
Fail, Claire	Laporte	2	16
Farmer, Charles	Oakland City	7	
Fechner, O. A.	Knox	1	11
Friedley, J. F.	Bridgeport	3	13
Friend, Morton	Orland	27	
Goshorn, M. R.	Clay City	8	4
Hanning & Son, J. H.	Evansville	13	13
Hanning, W. A.	Chandler	9	13
Helm, Lute	Moores Hill		15
Hogue, Allen E.	Vincennes	10	20
Indiana State Farm	Greencastle	47	37
Janney, H. C.	Alexandria	8	
Kaiser, H. F.	Moores Hill	1	16
Kring, Harry A.	South Bend	11	1
Linkenmeyer, M. C.	Lawrenceburg	2	17
Little, Oliver	Terre Haute	5	8
Mangrum, C. E.	Oakland City	8	2
Marks, John G.	Knox	18	2
Miller, Will G.	Aurora	1	19
Moss, Harry	Center Point	16	19
Niehau, William	Mount Vernon	7	3
Peters, John W.	Aurora	3	25
Pulver, Earle C.	Lowell	10	
Purviance, M. R.	Huntington	2	10
Rennoe, Joseph A.	North Liberty	2	22
Sankey, Charles O.	Terre Haute	1	16
Sargent Brothers	Brazil	29	1
Scherer, Geo. H. D.	Mount Vernon	14	
Schmitt, Clarence E.	Evansville	10	
Schlyer, E. S.	North Judson	6	23
Seifert, John L.	Mount Vernon	5	3
Steele, D. D.	Princeton	13	7
Stutsman, J. S.	Goshen	13	
Tatman, William H.	Lowell	5	5
Thornburg, Marvin H.	Winchester	8	1
Vermillion, John C.	Greencastle	2	13
Weninger, B. F.	North Judson	2	16
Weninger, G. H.	do.	6	8
White, Clarence	Knox	3	11
Williams, Burton	Muncie	12	40
Willson, Mrs. Mary G.	Osgood	1	171
Wolter, Frank	Gessie	24	1
Ziese, Albert E.	Crown Point	19	
Ziese, Frank E.	do.	12	4
Zimmerman, Paul	Brazil	20	
IOWA.			
Andrews, L. J.	Des Moines, R. 6.	1	21
Anderson, A. J.	Sumner	6	12
Beier, E. G.	Garner	19	5
Besser, E. F.	Newton	9	12
Bullard, F. E.	Thompson		14
Butterfield, G. E.	Swea City		25
Cass Farm Co.	Sumner	69	10
Christenson, W. J.	Lonerock	2	11
Cleverly, J. H.	Maxwell	43	
Davidson, U. G.	Algona	5	27
Dickman & Schrank	Sumner	11	15
Dreyer, H. K.	Lonerock	2	14
Fitzsimmons, H. S.	Granger	9	
Ford, Mrs. Mary T.	Riceville	32	
Gleim, L. G.	Arlington	54	
Hagge, George	Ledyard	7	11
Hamer, C. J.	Waterloo	17	
Hanson, P. A.	Britt		14

Tuberculosis Eradication under the Accredited-Herd Plan. 25

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
IOWA—continued.			
Hanson & Sauerbry.....	Oelwein.....	16	.....
Iowana Farms.....	Davenport.....	123	.....
Iowa State College.....	Ames.....	23	.....
Iowa State Institute for Feeble Minded Children.....	Glenwood.....	13	145
Justice, Frank.....	Berwick.....	8	38
Kenning, Henry.....	Manson.....	8	3
Kirschman, Fred W.....	Sumner.....	23	8
Kirschman, Henry.....	do.....	8	8
Kleiss, Adolph.....	do.....	9	10
Lageschulte, Wm.....	Waverly.....	1	12
Leaverton & Son.....	Granger.....	9	9
Loveland, W. B.....	Janesville.....	25	.....
McFadden, J. F.....	Algona.....	13	1
Miller, L. J.....	Wellman.....	4	18
Moser, Gottlieb.....	Sumner.....	3	19
Parsons, Sumner R.....	Irvington.....	5	9
Pieplow, Fred.....	Aurora.....	16	1
Raecker, Simon.....	Waverly.....	1	26
Robertson, Thomas.....	Des Moines, R. 6.....	1	27
Snyder, F. M.....	Marion.....	16	.....
Stewart, P. P.....	Maynard.....	49	1
Thompson, Walter.....	Sumner.....	9	22
Walker, R. H.....	Swea City.....	11	11
Wilcox, Edwin.....	Monticello.....	10	39
Wilson, Gerald.....	Thompson.....	.....	21
Yoder, Sanford C.....	Kalona.....	7	.....
KANSAS.			
Albright, C. M.....	Overbrook.....	9	5
Bales, F. W.....	Grenola.....	28	16
Bean, B. L.....	Mapleton.....	14	.....
Beyler, A.....	Harper.....	7	2
Bigham, C. L.....	Topeka, R. 1.....	15	7
Barnes, W. J.....	Oswego.....	.....	11
Bongartz, Frank.....	Ellis.....	13	36
Coleman, David, & Son.....	Denison.....	44	.....
Collins Farm Co.....	Sabetha.....	98	.....
Diehl, A. H.....	Enterprise.....	2	33
Dressler, H. A.....	Lebo.....	8	.....
Davis, F. F.....	Americus.....	9	6
Engle & Son, E. S.....	Abilene.....	38	1
Elliott, F. A.....	Paola.....	5	16
Enns, P. W.....	Newton.....	11	3
Freinmuth, W., & Sons.....	Tonganoxie.....	7	13
Flower, D. E.....	Mulvane.....	15	.....
Goodin, C. L.....	Derby.....	32	1
Gould, O. E.....	Norton.....	13	.....
Grossnickle, L. L.....	Onaga.....	4	5
Gosney, B. R.....	Mulvane.....	25	.....
Haverty, P. H.....	Hollenberg.....	18	8
Holdeman, H. N.....	Meade.....	12	9
Houk, Jesse.....	Americus.....	7	3
Holmes, J. F.....	Wellington.....	3	16
Hackney, F. S.....	do.....	1	39
High, O. G.....	Derby.....	18	2
Hoch, Vernon A.....	Emporia.....	4	1
Hann, J. W., & Son.....	Humboldt.....	22	26
Jansen, Herbert W.....	Clay Center.....	2	9
Jennings, R. W.....	Junction City.....	3	44
Kruger, H. W.....	Seneca.....	3	15
Kickapoo Indian Training School.....	Horton.....	24	1
Long, H., & Son.....	Haddam.....	23	1
Larson, A. D.....	Lyndon.....	5	5
Lenhart, Geo.....	Abilene.....	28	4
Marks, Thos.....	Emporia, R. 2.....	12	1
Michelson, A.....	Clay Center.....	12	12
Mast, J. P.....	Scranton, R. 2.....	28	.....
Mack, R. W.....	Longford.....	18	.....
Moellman, John H.....	Olpe.....	2	9
Oliver, Frank, jr.....	Danville.....	29	23
Peterson-Fitzgerald & Co.....	Jamestown.....	30	2
Ross, S. E.....	Iola.....	25	.....
Roney, A. M.....	Scranton, R. 3.....	1	18
Ray, D. A.....	Iola.....	3	8
Romig, Ira.....	Topeka.....	41	5

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
KANSAS—continued.			
Regier, J. E.	Whitewater.	10	
Stevens, Walter A.	Burdick.	15	6
Scrubby, W. D.	Hanover, R. 4.		14
Seekamp & Jeffries	Mulvane.	20	13
Swanwick, John.	Oswego.	9	5
Shay, L. E.	Atchison.	23	13
Schneider, Ben	Nortonville.	24	
Tompson, Zac.	Harper.	7	
Turkle, H. D.	Mulvane.	2	13
Violet, E. R.	Fall River.	16	1
Vandever, C. B.	Ashland.	18	64
Williams & Terrill.	Seneca.	34	
Wisner, Mrs. Bertha.	Iola.		12
Wilcox, A. B.	Topeka.	50	
Waples, Fred.	Wichita.	11	4
Young, George.	Manhattan.	10	
Young, J. L.	Haddam.	4	20
KENTUCKY.			
Alfred, David.	California.	1	17
Adina Farms.	Dover.	9	
Bailey, Gilbert L.	Lexington.	29	1
Berea College.	Berea.	24	64
Colbert, E. R.	Boston Station.	8	40
Connor, Hubert.	Hebron.	14	
Eastern State Hospital.	Lexington.	14	40
Eisen, Alfred.	California.	7	18
Fardo, G. E.	do.		10
Giltner Bros.	Eminence.	36	2
Harrison, Albert.	Butler.		14
Harrison, F. P.	do.	1	11
Harrison, F. W.	Alexandria.	1	16
Harrison, J. R.	do.	3	17
Haneter, Lewis.	Buckner.	2	18
Herringer, Alfred.	California.		12
Hitt, Roger.	La-Grange.	8	12
Kentucky School for Deaf.	Danville.	1	28
Leet, Camden E.	Glenarm.		17
McNean, Sandy.	Alexandria.	1	14
Markley, G. E.	Foster.	14	
Meyers, Mrs. E., & Son.	California.		12
Miliken, W. M.	Paducah.		12
Noertker, John.	California.	1	13
Peoples, C. B.	Butler.	12	13
Pogue, William E.	Mays Lick.	2	13
Randall, Harry.	Butler.		18
Rosensteil, Sam.	Falmouth.		25
St. Rose Priory.	Springfield.	29	
Shaw, J. K.	California.	1	24
Smith, Clarence.	Crestwood.	13	5
Stewart Home.	Farmdale.		33
Taylor, Fred.	Buckner.	7	5
Taylor, Wm. H.	Mays Lick.	9	7
Weaver, Verner.	California.	16	1
Wirsch, John, sr.	do.		14
LOUISIANA.			
Carter, W. A.	Hammond.	5	30
East Louisiana Hospital for Insane.	Jackson.	11	7
Hyde, B. T.	Fluker.		10
Louisiana State University.	Baton Rouge.	17	
Morris-Day Co.	Kentwood.	8	26
Munch, Jake.	New Orleans.		18
Tarviere Dairy.	Burwick.	6	42
MAINE.			
Additon, Leslie F.	Greene.	34	
Alexander, Harry I.	Oakland, R. 33.	8	9
Austin, C. A.	Greene.		17
Bailey, John H.	North Vassalboro.	11	6
Bassett, F. S.	New Sharon.	22	3
Beckler, B. H.	Greene.	5	10
Beckler, G. K.	South Leeds.	14	
Benner, G. P.	Monmouth.	27	
Berry, H. P., & Son.	Livermore Falls.	6	28
Blaisdell, T. W.	Sabattus.	11	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE—continued.			
Blanch Bros.	Lubec	20	12
Blanchard, S. M.	Cumberland Center	1	23
Bodkin, A. H., & Son	Cumberland Center, R. 1.	5	8
Brooks, F. C.	Newport	3	19
Brown, P. B.	Augusta	8	8
Brown, Willie E.	Waterville		11
Bryant, P. J.	Freedom	1	19
Burt, F. M.	Greene	5	4
Russell, R. L.	Wellington	2	11
Chamberlain, G. A.	Waterville		10
Clark, A. W.	Castine	2	25
Clark, Wm. T.	Greenville		11
Clearwater, H. P.	Hallowell		
Corz, H. W., & Son	Mechanic Falls	11	
Crouse, Marshall B.	Crouseville	6	6
Cummings, C. W.	Hebron	7	11
Daggett, C. M.	Danforth	2	9
Davis, Fry	Waterville	3	10
Davis, Lewis A.	Biddeford	2	9
Deering, Wm. B.	Hollis Center	18	
Dixon, James P.	West Lebanon		11
Drew, J. M.	Greenville		11
Drummond, F. C.	Waterville		17
Edmonds, A. C.	Monroe		11
Eldridge, Ralph W.	South Brewer		14
Emerson, Delmont, & Son	Island Falls	25	3
Emery, Herbert G.	Kittery Depot	7	5
Farnham, H. W.	New Gloucester		13
Farrington, A. H.	Brewer		19
Farrington, F. B.	do.	1	16
Fogg, Almon W.	Greene		20
Foss, Joel.	Weston		16
Foster, L. P.	Unity		12
Frank, W. C.	Auburn	13	
French, Joseph W.	Windsorville	8	15
Galusha, W. H.	Greenville	1	10
George, Chas. W.	South Brewer		20
Gerald, Walter	Unity	4	6
Gerald, Wm.	do.		16
Gile, Leland H.	Alfred	1	19
Gilpatrick, Arthur W.	Danforth	18	3
Hall, Harry, & Son	Houlton	6	22
Hanson, Geo. W.	Sanford		16
Hart, Le Roy L.	Brewer	2	8
Hayward, J. P.	Topsham		13
Hitchings, Herbert B.	Caribou		27
Hodges, A. E.	Fairfield Center	44	
Holyoke, John W.	Brewer		15
Howard, J. F.	Waterville		15
Hoyt, J. L. & W. A.	Farmington	4	20
Hoyt & Kneeland	Presque Isle		13
Huff, A. L.	Harmony		21
Ingraham, J. W.	Thorndike	3	31
Jackson, Geo. B.	Waterville		15
Jillson, E. D.	Greene	1	10
Johnson, Nathaniel	Augusta		20
Jones, John D.	Oakland		20
Jones Sisters	West Brooksville		19
Jordan, Howard L.	Waltham		11
Keddy, Geo.	Harmony		17
Leach, M. L.	Casco		11
Lermond, Richard J.	Lincolnville		13
Lewis, C. E.	Waterville	1	23
Lewis, Harry A.	Springfield	5	
Lewis, L. L.	Brewer	1	38
Lincoln, H. M.	Corinna	5	7
Little, A. L.	Brewer		15
Littlefield, A. D.	Newport		13
Lowell, Charles A.	Lee	18	
Lovejoy, A. G.	Norway		15
Lyons, M. S.	Calais	22	
Mahoney, Geo. A.	Lincolnville	1	13
Maine School for Feeble Minded	West Pownal		38
Mansfield, Mrs. B. B.	Jonesport	18	
Martin, Dennis L.	Mechanic Falls	2	14
McCready, R. H.	Dansforth	10	15
McKinney, H. B.	Lincolnville		20

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE—continued.			
Merrill, Alice F.	Portland.	1	15
Metcalf, W. L.	Farmington.	4	23
Miller, A. H.	Lincolnville.		10
Moody, J. F., jr.	Hebron.	7	3
Morrison, Chas. C.	Mariaville.	8	6
Morrison, Ernest.	Livermore Falls.		12
Muzzy, S. L.	Greenville.	4	53
Nash, Harold H.	Camden.	5	9
Nickless, G. W.	Freedom.		12
Norton, B. O.	Belfast.	10	11
Odiome, A. E., jr.	Greene.	9	5
O'Neil, Harry.	Fairfield Center.		12
Page, Edward H.	Richmond.	5	2
Patterson, L. D.	Waterville.		17
Peabody, R. T.	Houlton.	1	16
Peabody, W. J.	Exeter.	7	4
Pease, Warren H.	Wellington.		2
Pellerin, Alex.	Oakland.	13	24
Perkins, David B.	do.		11
Philbrick, Ralph E.	Bangor.		11
Philbrook, Frank W.	Greene.	12	5
Picard Bros.	Waterville.		40
Pike, C. L.	Lubec.	24	
Plowman, James L.	South Portland.	12	
Potter, A. C.	Wytopitlock.	4	7
Pulkkenin, Antti.	Livermore Falls.		23
Pulkkenin, John.	do.		23
Pulsifer, Clarence S.	East Poland.	14	
Pulsifer, C. L.	do.	15	3
Reny & Son, Wm.	Waterville.		13
Richardson, Ernest T.	Mount Desert.		10
Richardson, Geo. W.	West Paris.	5	8
Rideout, C. H., & Co.	Houlton.	5	2
Rines, J. Henry.	Westbrook.	16	50
Ring, F. E.	South Brewer.		23
Robinson, Irving W.	Bangor.		18
Robinson, N. E.	do.		19
Ronco, J. A.	Waterville.		20
Rose, Ernest A.	Greene.	12	2
Russell, Abbott A.	Mechanic Falls.	14	1
Sanborn, F. S.	Sabattus.	3	9
Sawyer, H. M.	Gray.	1	30
Schillinger Bros.	Danforth.	4	20
Schopple, J. A.	Machias.	5	7
Seavey, Eastmen P.	Biddeford.		15
Seeley, Nemiah E.	Houlton.	13	12
Serois, Henry.	Oakland.		10
Sewell, Edward L.	East Lebanon.		21
Shores, Harry C.	Waterville.		15
Sherrard, Geo. E.	do.		11
Simpson, H. M.	South Brewer.		11
Sivisky, Frank.	North Vassalboro.		11
Small, Dana L.	North Dixmont.	9	5
Small, F. E.	Freedom.	1	26
Smart, Harry.	North Dixmont.		16
Smith, Edgar L.	Waterboro.	16	11
Smith, Lemuel H.	South Brewer.		12
Spencer, Luther E.	Biddeford.	8	15
Spiller, W. H.	Gorham.	26	
Stanley, Daniel M.	Kennebunkport.		13
Stanley, S. B.	Brewer.		15
Stetson Bros.	Waterville.	27	
Stevens, Winfield.	Harrison.	13	
Strong, W. E.	Augusta.	12	9
Summit Lumber Co.	Davidson.	128	
Thaxter, Mrs. Celia A.	West Falmouth.	18	2
Thompson, Dr. John B.	Machias.	1	10
Thompson, Merle L.	Jay.	9	20
Trafton, W. H.	Waterville.		15
Trickey, C. J., & Son.	Corinna.	33	22
Tyner, Geo. W.	Mechanic Falls.		10
Vigue, C. H.	Waterville.	26	4
Walker, Geo. H.	Fryeburg.	1	13
Ward, Arthur N.	Waterville.	6	6
Western Maine Sanatorium.	Greenwood Mountain.	8	19
Wight, O. C., & Son.	do.	6	11

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE—continued.			
Williams, J. E.	Oakland.		14
Williams, G. M.	Sabattus.	11	15
Wing, Forest H.	Levant.	1	13
Winslow, W. E.	Cumberland Center.	11	7
Wood, John C.	Greene.	1	12
Wright, Walter P.	Bangor.		14
Yerxa, Wm. R.	Houlton.	7	6
Young, C. C.	West Pownal.	6	13
Young, S. P.	Greenville.	1	14
MARYLAND.			
Anderson, W. O.	Ardmore.	2	23
Anson, F. H., jr.	Indianhead; post office address, Irro- quois, Falls, Ontario.	22	
Bailey, W. F.	Forest Hill.		12
Ball, S. M.	Buckeystown.	1	19
Blick, W. D.	Silver Spring.	8	16
Bliss, Geo. R.	do.	6	
Bowles, M. W.	Middletown.		15
Burrier, Grayson.	Walkersville.		16
Canby, B. J.	Colesville.	1	18
Corby, Chas. I.	Garrett Park.	8	
Cordell, J. W.	Lander.		24
Coughlin, R. T.	New Market.		22
Creagor, W. T.	New Midway.		12
Crum, Roy L.	Walkersville.	10	1
Culler, W. Walter.	do.		18
Davis, L. A.	Farm, American University Park; post office address, 1830 Eleventh Street, N. W., Washington, D. C.		11
Dennis, John M.	Riderwood.	26	
Ehrhart, John H.	Hampstead.	22	
Eldridge, R. A.	Hagerstown.	17	6
Flook, J. Ridgley.	Brunswick.		18
Fogle, C. Walter.	Lewistown.		18
Garrett, M. L.	Brooklandville.	8	6
Grove, Luther.	Hagerstown.	5	9
Hedges, Chas. H.	Walkersville.		23
Hedges, David L.	do.		15
Henry, John W., jr.	Easton.		26
Hickman, Saml. T.	Silver Spring.		13
Hutchinson, H. M.	Cordova.		15
Kefauver, A. C.	Frederick.		17
Kefauver, J. L.	Rockville, R. 2.	1	30
Kelley, H. M.	Silver Spring.	4	19
Kiplinger, Bernard.	Silver Hill.		12
Kline, Rufus N.	Woodsboro.		15
Leasure, Lafayette.	Cumberland.		16
Lowrey, Otho B.	Sharpsburg.	4	12
Lydinger, J. J.	Cumberland.		23
McCeney, W. H.	Silver Spring.	5	21
Moore, Saml.	do.	6	15
Nigh, Chas. B.	Hagerstown.	11	13
Pennington, Mrs. E. B.	Kennedysville.	1	24
Phillips, S. L.	Rockville.	5	2
Ramsburg, Alva S.	Ellicott City.	12	1
Rathell, Donald.	Easton.	15	1
Rensburg, Albert S.	Middletown.	12	17
Rench, Robert:			
Farm No. 1.	Hagerstown.	6	10
Farm No. 2.	do.		10
Smith, Wheeler A.	Myersville.	14	2
Smith, Wm. J.	Benson.	2	22
Steele, J. Harry.	Watersville.	39	2
Stine, J. Frank.	Forest Hill.		19
Willis, H. C.	Worton.		25
Wilson, John A.	Boonsboro.	1	22
Windham, G. C.	Sandy Spring.		21
Wintermoyer, J. J.	Hagerstown, R. 2.	3	11
Zeiler, J. D.	Tuscarora.	1	13
Zimmerman, Harry E.	Walkersville.	1	17

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MASSACHUSETTS.			
King, Frederick A.	Northboro.	10	.....
MacDougal, A. F.	Westford.	9	1
Northfield Seminary.	Northfield.	97	24
MICHIGAN.			
Aldrich, Hugh G.	Fowlerville.	14	6
Anderson, O. A.	Kent City.	5	7
Armstrong, Mrs. Bert.	Fowlerville.	6	.....
Armstrong Bros.	do.	11	.....
Baker, R. A.	Adrian.	12	.....
Becker, Guy.	Kendall.	8	.....
Beeson & Holden.	Three Oaks.	24	.....
Berridge, A. J.	Hudson.	30	2
Bowlyby, Jay F.	Ovid.	15	2
Brewer, E. M., & Son.	Ross.	19	2
Brower, R. D.	Hopkins.	18	.....
Buth Bros.	Comstock Park.	22	.....
Buth, John C.	Grand Rapids.	21	.....
Campbell, J. A., & Son.	Parma.	13	.....
Carr, Robin.	Fowlerville.	30	.....
Childs, S. S.	Manitou Beach.	11	.....
Clayton, Chas. J.	Berlin.	7	.....
Clough, Vernon C.	Parma.	21	.....
Cook, Joseph C.	Howell.	3	11
Copland, Alexander W.	127 Franklin Street, Detroit.	40	.....
Cornell, Earl R.	Howell.	13	1
Crandall, Tracy F.	do.	19	.....
Curtis, N. S., & Son.	Adrian.	15	2
Daniels, M. H., & Son.	Okemos.	20	.....
Dutcher, D. D.	Owosso.	23	.....
Emblagaard Dairy	Marquette.	70	.....
Emanuel Missionary College	Berrien Springs.	12	13
Faler, C. B.	Adrian.	14	.....
Fleming, A.	Lake.	19	7
Foster, W. C.	Morenci.	23	.....
Franz, Geo. L.	Eau Claire.	25	2
Gamble, Walter.	Caro.	24	.....
Gibson, Wm. C.	Fowlerville.	12	3
Gordon, C. W.	do.	20	1
Green, B. H.	Jasper.	12	1
Haight, M. C.	Gobleville.	33	.....
Haller, Geo.	Howell.	14	1
Hart, B. M.	Fowlerville.	15	.....
Hart, C. J.	Clayton.	25	1
Hart, Milo.	Adrian.	15	.....
Harwood, L. W.	do.	18	.....
Cessna Farm.	do.	25	.....
Wilt Farm.	do.	24	.....
Hicks, Robt. J.	St. Johns.	21	.....
Hine, C. G.	Rochester.	8	.....
Holcomb, Mrs. Alice, & Son.	Oak Grove.	16	2
Holcomb, W. H.	Linden.	19	.....
Hoover, D. H.	Howell.	26	.....
Hopson, James, jr.	Owosso.	16	2
Hutchinson, Grover C.	Shepherd.	33	.....
Jones, James B.	Detroit.	20	.....
Jones & Lutz.	Oak Grove.	12	.....
Keefer, Fred A.	Morenci.	8	.....
Knisel Bros.	Blissfield.	30	.....
Knopf, Fred, jr.	do.	11	2
Koeman, Abraham.	Holland.	23	.....
Lange, Ferd J.	Sebewaing.	16	7
Lannen, R. M.	Howell.	7	9
Larsen, Peter.	do.	9	8
McCrory, Robt., & Son.	South Lyon.	23	1
McPherson, M. J., Prospect Farm.	Howell.	79	.....
McPherson, R. Bruce.	do.	22	.....
McNitt, E. W.	Grand Rapids.	39	.....
Michigan Industrial School.	Lansing.	40	.....
Michigan School for Deaf.	Flint.	34	15
Miller, D. G., & Sons.	Eaton Rapids.	28	.....
Morlock, E. H., & Sons.	Fowlerville.	21	.....
Munsell, J. & E.	do.	22	.....
Musolf Bros. Farm No. 1.	South Lyon.	10	.....
Myers Bros.	Adrian.	14	.....
Parmelee, W. D.	Hopkins.	.....	.....

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MICHIGAN—continued.			
Pless, Fred E.	Brighton.	29	
Potter, Rhine.	Moline.	13	8
Pullman, H. J.	Adrian.	6	
Rapp, D. G.	Lansing.	25	
Rasch, Robert.	Alpine.	6	
Rasch, Wm.	Berlin.	17	
Reed, C. A.	Jasper.	12	
Reed, Irvin E.	do.	6	1
Ridenour, Murrett.	St. Johns.	8	
Rising, H. E.	Woodland.	21	
Rumsey, Oscar.	Hudson.	18	3
Rundel, W. L.	Saline.	10	1
Ruttman, August.	Fowlerville.	18	
Salisbury, E. L.	Shepherd.	23	
Schneerer, Ezra E.	Rockford.	7	2
Schoof, Wm. C.	Washington.	24	
Scott, Royal R.	2212 Hollywood Street, Toledo, Ohio.	14	12
Shady Knoll Farms Co.	Ypsilanti.	26	
Shubel, Fred E.	Lansing.	18	
Sindlinger Bros.	Lake Odessa.	28	
Smith, A. L.	Howell.	21	
Smith, E. L.	Adrian.	14	
Sorg, Wendelin.	Oak Grove.	11	
Spitler, W. T.	Owosso.	14	
Switzer, Geo. H.	Oak Grove.	13	
Taft, P. M.	do.	8	1
Tayer, Fred S.	Adrian.	9	
Traverse City State Hospital.	Traverse City.	149	
Vanderkarr, E. E.	Owosso.	15	
Van Syckel, Taft.	Stockbridge.	20	
Voepel, H. L.	Sebewaing.	13	
Walker, L. R.	Howell.	19	
Wilder, C. E.	Grand Rapids.	5	
Wilson, C. A.	Lansing.	16	
Wilson, C. W.	Mason.	14	
Wilson, J. L.	Grand Rapids.	12	15
Winne, C. E.	Adrian.	20	2
Worthington, John W.	Howell.	13	
Yntema, John.	Hudsonville.	7	
Yerington, L. A.	Ross.	15	8
Ziegler, Joseph L.	South Lyon.	7	3
MINNESOTA.			
Agrimson Bros.	Sebeka.	10	13
Agrimson, Alfred.	Whalan.	7	22
Akins, Arthur T.	Watertown.		12
Akins, Edwin J.	Mayer.	25	
Allen, S. L.	Winnebago.	2	7
Almquist, Jens.	St. Hilaire.		11
Amley, C. O.	Berlin.	8	16
Anderson, A. W.	Hallock.	1	12
Anderson, Wm. E.	Rush City.	3	1
Anton, Hans.	St. Hilaire.		13
Archer, M. L.	Ogilvie.	1	13
Ardolf, Jos.	Glencoe.	1	24
Atherton, J. B.	Wheaton.	5	29
Augustine, Chas.	Glencoe.		14
Austin, E. J.	Owatonna.		11
Avelson, A.	St. Hilaire.	1	16
Bakken, Carl M.	Sebeka.		17
Ballendach, M. H.	Nerstrand.	11	25
Bang, Oliver H.	Canton.		11
Bangert Bros.	Armstrong.		25
Bargman, Fred.	Brownston.	11	20
Bartley, C. N.	Huntley.	13	10
Bednar, J. C.	Glencoe.		16
Beneke, Mrs. Ida.	do.		28
Benson, John.	Darling.	5	8
Bipes, Edw.	Brownston.		10
Block, Paul.	Hutchinson.		10
Bolland, Dick.	Ottertail.	2	32
Boucher, Geo.	Waseca.	8	19
Bowen, D. E.	Cambria.	5	15
Boyum, O. B.	Peterson.	2	45
Brelje, Henry.	Glencoe.		26
Brisbane, O.	Waseca.	3	7

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MINNESOTA—continued.			
Broeker, F. C.	Wahkon		13
Brown, H. J.	Campbell	1	13
Brown, W. J.	Mora	20	3
Bruggerman, J. A.	do.	3	17
Budensick, B. H.	Red Wing	6	12
Bue, H.	Northfield	27	
Byhaug, Gunder	Dawson	8	21
Calef, Fred C.	Hector	12	3
Cartin, Tom	Ellendale	1	18
Cashman, Thos. E.	Owatonna	9	54
Casper, J.	Wahkon		17
Cassel, Walter	Dover	4	10
Caulfield & Calverley	Byron	26	21
Chapin, Cleon P.	Cheney	4	20
Chapin & Sons, T. W.	do.	22	31
Chellson, F. L.	Cannon Falls		21
Chladek, B. P.	Owatonna	12	8
Christenson, O. W.	Eureka	4	19
Church Bros.	Minnesota City		16
Clark, J. L.	Lake Crystal	13	12
Cook, F. S.	Marshall	8	3
Crane & Son, M. F.	Garden City	1	21
Daniels, H. B.	Stanton	14	
Dascher, Fred	Biscay		18
Day, Richard	Graceville	13	10
Dietel, Wm.	Norwood		18
Dock, J. M.	Stanton	20	2
Dockstader, A. G.	Hastings		14
Dolezal, John	Biscay	1	23
Donahue, Matt	International Falls		10
Dressell, E. H.	Hutchinson		41
Edblom, Stanley	Carver		23
Ehrke, Gus.	Winona		17
Eisert, E. R.	Waseca	2	20
Ellefson Bros.	West Concord	4	30
Elmhurst Farm	Robbinsdale	16	28
Emery, Earl R.	Stanton	24	
Evans, Henry	Mankato	5	13
Evenson, Tom	Lake Crystal	3	26
Ewald, James	International Falls		23
Fabian Bros.	Western		12
Fabian, C. A.	Campbell	6	9
Farr, R. W.	Ellendale	12	10
Featherstone, G. H.	Hastings	2	9
Fink, Ferd.	Conger	1	28
Fischer, Dr. H. P.	Shakopee	38	
Foelster, H.	Mankato	4	15
Follingstead, H. A.	Zumbrota	8	7
Fox Bros.	Blue Earth	31	
Fox, Merl W.	Lake Crystal	3	13
Franz Bros.	Mountain Lake	4	16
Fredericksen, F. A.	Lake Crystal	1	29
Fredstrom, F. G.	Brainerd	1	28
Gehlen, Joe	Glencoe	1	18
Gehlen, G. P.	do.	1	13
Gleason, F. E.	Austin	17	20
Glen Lake Farm School	Hopkins	10	27
Gochbauer, Jay D.	Skyberg	8	26
Goulet, Herman L.	Glencoe		12
Graupmann, Albert A.	Hamburg	10	13
Graupmann, Herman	Biscay		31
Green, C. O.	Ruthlon	2	19
Gripp, F. J.	Northfield	10	10
Groth, Henry	Lake Crystal		11
Grover, O. J.	Glyndon	31	
Gruenhagen, F. H.	Brainerd	18	16
Guillaume, Anthony	Caledonia	11	
Haapala, Levi	Dassel	1	14
Haines, O. M.	Rush City	2	10
Halloran, James	Browerville		15
Halverson, H. S.	Austin	6	
Hammond, J.	Winona		12
Hankerson, G. W.	Medford		14
Hanson, Andrew	East Grand Forks	2	18
Harris, Frank	Truman		13
Haselton, Andrew	Alexandria	15	21
Haslerud, O. A.	Peterson, R. 2	5	1

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MINNESOTA—continued.			
Hecht, E. B.	Waseca	8	
Hecht, R. J.	do.	9	8
Heifert, E. A.	Stillwater	24	
Heinz, Emil	Owatonna, R. 9	12	
Henry, Jas.	Dover	9	28
Henske, Rudolph	Brownston	1	29
Hertwig, Aug.	Glencoe		12
Hibbard Bros.	Glenwood	6	12
Hinkley, G. W.	Freeborn	32	
Holmes, Winfield	Wrenshall	3	30
Homan, H. O.	Biscay		10
Horn, Otto H.	Bejou	8	
Horton, H. C.	Glencoe		11
Horton, L.	do.		12
Horton, W. F.	do.		19
Howe, A. C.	do.	2	20
Hoyum, M. O.	Dawson	1	14
Hudson, Geo. A.	Mora	10	3
Irwin, John B.:			
Farm No. 1.	Minneapolis.	14	
Farm No. 2.	do.	37	
Farm No. 3.	do.	54	
Farm No. 4.	do.	25	1
Jackson, J. A.	Shafer	1	16
Jensen, Carl A.	Hutchinson	1	23
Jensen, Fred C.	do.	1	18
Jepsen, H.	St. Hilaire	1	9
Jergens, W. Ed.	Biscay	19	41
Johansen Bros.	Tyler	23	
Johnson Bros.	Glencoe	2	32
Johnson, Arthur B.	New Richland	19	
Johnson, J. V.	Watertown		10
Johnson, Leonard	Butternut Valley	1	21
Johnson, Norman A.	Albert Lea	3	17
Johnson, Oscar	Clarks Grove	12	
Johnson, W.	Ellendale	17	
Johnstone, W. R.	New Richland	3	9
Jones, Charles.	West Concord	24	22
Jorgens, H. H.	Biscay	23	26
Julian, T. J.	Fergus Falls.	28	
Jungclauss, Wm.	Glencoe	1	23
Kaplan Bros.	Owatonna, R. 3.	5	19
Kaspar, J. A.	Medford.	22	
Kemen, John.	Madison.	17	21
Klug, N. R.	Caledonia.	6	14
Knaddle, T. W.	Thief River Falls.		12
Koochiching Realty Co.	International Falls.	14	69
Kouba, Frank.	Hutchinson	16	1
Kratzke Bros.	Cologne	10	12
Kreil, Jos.	Biscay	1	26
Kroehler, Ph.	Henderson	4	15
Krueger, G. A.	Albert Lea, R. 5.	1	20
Lammers, F. E.	Lakeville	1	24
Larson, M. C.	Northfield.	22	1
Larson, Ole.	St. Hilaire, R. 1.		20
Leach, C. H.	Stewartville.	23	
Lehrke, F. E.	Waconia.	4	16
Lundheim, Tom.	Onamia.		21
Liarre, Olaf.	New Richland	2	27
Liddle, F. T.	Hastings.	9	7
Lincoln, L. G.	Mora.		10
Ling, Fred.	Worthington.		14
Little, R. J.	Buffalo.	9	
Long Lake Live Stock Co.	St. Paul, 668 Cable Avenue.	31	
Lonning, Martin.	Lake Crystal.		14
Luehrs, Fred.	Glencoe.		28
Lunde, Carl A.	Minneota.	17	
Lynard, J.	Owatonna.	1	24
McCormack, A. D.	Garden City.	4	22
McCrum, W. E.	Thief River Falls.	1	14
McNelly, C. L.	McIntosh	26	
Malchow, Elmer.	Biscay	1	10
Mallory, Melvin.	Mora.	4	14
Mallory, W. L.	Mora.		10
Maltzan, M.	Shevlin	1	12
Mann, W. P.	Dodge Center	27	18
Marschall, Henry A.	Shakopee	2	18

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MINNESOTA—continued.			
Marschall, Math.	Shakopee	1	28
Marschall, Wm. F.	do.		13
Melwold, A. E.	Fairfax	10	9
Menzel, Gus.	Hamburg		20
Meuleners, P. J.	Cologne		15
Meyer, John	Hutchinson	1	27
Mielke, Edwin	Glencoe	1	34
Miller Bros.	Plato		39
Miller, Chas. H.	Northfield	29	
Miller, Geo. E.	Frazee	11	7
Miller, Frank B.	Northfield	30	
Miller, H. G.	do.	30	
Miller, J. C.	Winona	1	29
Minneapolis Workhouse Dairy	Minneapolis	25	40
Mittelstadt, R. E.	Wendell	6	13
Monkemier, Carl	Glencoe		16
Moravec, Jos.	Biscay	8	15
Moravec, Peter	do.	1	19
Moravec, Theo.	Glencoe	1	14
Morris, Robert	Mapleton	2	18
Munsch, J. C.	Shakopee	21	1
Munson, Nels.	Cannon Falls	5	10
Murphy, J. F.	Lakefield	12	18
Nelson, A. E.	Gonvick	2	16
Nelson, Julius	Thief River Falls		27
Nemec, Albin	Glencoe		12
Newstrom, Ed	Watertown	8	10
Nichols, Z. M.	Mankato	3	13
Nielsen, H. J. P.	Lake Benton	6	15
Nims Bros.	Hutchinson	3	31
Nims, G. W.	Staples	3	9
Norborn, Edward	Leonard		10
Nordvold, Jesse C.	Zumbrota	13	7
Nyberg, O. W.	Dassel	13	13
Oby, Chas.	Maple Lake	17	
Odden, L. J.	Grand Meadow	3	2
Oech, Fred	Winona	1	21
Oren, Tilmán G.	Mora	3	17
Olson, Henry A.	Grove City	22	
Orton, Irwin J.	St. Cloud	11	12
Ostrom, John	Mora	1	38
Perchan, Fred G.	Glencoe		20
Peterson, Alfred C.	Clarks Grove	16	
Peterson, Amos	Watertown	1	13
Peterson, B. C.	Cannon Falls	5	24
Petrich, Chas.	Glencoe		14
Picha, F. J.	Hopkins	3	22
Picha, Joe	Glencoe		10
Pierce & Son, H. M.	Minnesota City	1	15
Pinz, H. H.	Wahkon	1	15
Pohdrasky, Chas. A.	Biscay	1	9
Pohlman, Geo.	do.	1	22
Portele, Joe	Glencoe		21
Price, W. E.	Lake Crystal	1	10
Qvale, C. A.	Farmington	2	20
Rannow, Frank N.	Biscay		18
Rasmussen, Walter	Alden	1	25
Rathert, W. F.	Mora	3	23
Reese Bros.	Goodhue	12	6
Reiner, F. A.	Northfield	8	1
Rhen, Erik G.	Clearbrook	1	12
Roose, W. H.	Plummer	1	14
Rotzien, Wm. A.	Hutchinson	1	11
Rowekamp, Geo. L.	Winona	4	24
Rynestad, T. K.	Thief River Falls		12
St. Olaf's College	Northfield	24	8
Sargent, C. A.	Red Wing	5	21
Sargent, Cecil C.	do.	12	4
Satre, John V.	Frost		10
Schmidt, A. J.	Norwood		13
Schmidt, Geo.	Glencoe		13
Schmidt, Wm.	St. Peter	20	6
Schmit, J. M.	Pillager	14	
Schultz, Fred	Biscay	6	17
Schultz, Walter	do.	6	25
Schwager, Joe	Utica	30	9
Seath, L. A. & G. A.	Albert Lea	19	12

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MINNESOTA—continued.			
Shaw, Oscar C.	Lake Crystal.	2	8
Skrei, T. H.	Glyndon.	20	.....
Smith, Chris.	Zumbrota.	1	16
Smith, W. C.	Bingham Lake.	4	9
Sorenson, N. P.	Alden.	12	13
Sorenson, Wm. S.	do.	.....	14
Stanford, A. D.	Mankato.	2	11
State Sanitarium.	Walker.	.....	62
Stearns, E. J.	Hutchinson.	5	29
Steele, Frank W.	Alden, R. 1.	5	16
Stevens, E. M.	Hastings.	.....	13
Stevens, M. L.	Castle Rock.	7	7
Stockstader, Allen G.	Hastings.	12	5
Stoeckman, John.	Green Isle.	9	16
Storstad, I. J.	Brainerd.	.....	23
Storvick & Son, A. O.	Albert Lea.	4	33
Storvick, T. A.	Albert Lea, R. 6.	11	21
Sullivan, Jas.	East Grand Forks.	.....	27
Do.	Wrenschall.	33	14
Svigum, Edward.	Peterson.	1	18
Taylor & Christgan.	Owatonna.	47	.....
Teeter & Collins.	Granada.	30	23
Telkamp, H.	Fergus Falls.	22	.....
Tessmer, Emil.	Biscay.	7	24
Tessmer, John.	Glencoe.	11	16
Thomson, R. J.	Blooming Prairie.	37	3
Timm Bros.	Morristown.	12	3
Tonsignant, E. A.	Mendota.	6	7
Turbenson, Theodore.	Spring Valley.	1	28
Uhls, J. W.	Glencoe.	2	11
University of Minnesota Farm.	St. Paul.	32	.....
Van Slyke, S. E.	Northfield.	41	.....
Wacek, Wm.	Biscay.	.....	17
Wagner, Peter.	Glencoe.	.....	13
Waldal, A. J.	Plummer.	1	18
Waldal, Geo. & Marius.	do.	1	22
Walker, W. W.	Austin.	41	.....
Welch, A. C.	Glencoe.	.....	15
Welch, Harve E.	Hutchinson.	9	11
Wenner, Louis W.	Mankato.	4	12
Wiener, Caspar.	Thief River Falls.	10	10
Williams, D. L.	Cambria.	5	.....
Wilshusen, Henry.	Fergus Falls, R. 5.	3	24
Wohlford, H. E.	Trosky.	15	8
Wolff, August.	Glencoe.	.....	24
Wright Co., Charles.	Fergus Falls.	9	.....
Zakariasen, P. M.	Brainerd.	4	18
Zimmerman, L. P.	Waseca.	.....	31
MISSISSIPPI.			
Boyd, J. C.	New Albany.	1	10
Butler, W. J.	do.	3	5
East Mississippi Insane Hospital.	Meridian.	16	35
Gosha, Joseph F.	Aberdeen.	8	14
Kennedy, R. E.	Newton.	13	5
Lord, Jno. L.	Hermanville.	1	35
Lucas, Thomas.	Greenwood.	7	25
McDaniel, S. J.	Springfield.	1	63
Muth, Wm. G.	Sandy Hook.	3	10
Oakhurst Plantation.	Duck Hill.	.....	66
Payne, H. F.	Forest.	.....	14
Robbins, E. D.	New Albany.	.....	15
Schweirjohn, F. B.	Lumberton.	3	26
Scott, Jack L.	Granada.	1	5
Sloan, W. D.	New Albany.	1	4
Still, C. P.	Senatobia.	7	7
Weever, Elias.	Houston.	2	13
Yarbrough, T. M.	Louisville, R. 3.	12	5
MISSOURI.			
Ayers, W. F.	Marshfield.	.....	11
Beauchamp, W. M.	Pacific.	1	92
Benoit, N. A.	St. Charles.	22	.....
Bluhm, H. A.	Sedalia.	11	12
Bluhm, John F.	Smithton.	9	12

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MISSOURI—continued.			
Bode, H. F.	Egypt Mills	2	16
Bolte, Oliver	Smithton	12	12
Bradshaw, T. H.	Lamonte	12	15
Brinkopf, Wm. C.	Cape Girardeau	9	7
Chappel, L. E., & Son	Springfield	31	14
Chitwood, G. D.	Carl Junction	7	8
Daniel, J. B.	Piedmont	9	7
Davis, Glenn G.	Columbia	45	21
Diedrich, F. A.	Fordland		57
Dow, R. W.	Sedalia	22	17
Driver, C. E.	Crescent	41	10
Engram & Collins	Cape Girardeau	1	34
Evans, Roy C.	Marshfield	8	16
Files, W. E.	Lamonte	15	41
Finck, E. P.	St. Charles	11	15
Fortner, W. M.	Craig	15	
Gerlach, Fred C.	Cape Girardeau	1	11
Hagemann, Henry W	St. Charles		13
Hartman, H. F.	Marshfield	1	11
Heuer, B. H.	Cape Girardeau	2	19
Hill, H. L.	Sedalia	11	14
Hitt, W. J.	Cape Girardeau	3	23
Hoerman, Wm	Smithton	10	16
Hughes, R. L.	Marshfield		10
Jaeger, George J.	Smithton	8	13
Kelley, Dr. Ralph R.	Savannah	2	18
Kruse, J. A., & Son	Smithton	5	11
Kurre, Ed.	Cape Girardeau		14
Lamm, Henry, jr.	Sedalia	15	57
Larkspur Dairy	Hillsboro	14	51
Luetjen, Golder A.	Smithton	5	11
McQueen, Sam P.	Purdy	8	1
Manning, R. O.	Marshfield		15
Manning, L. E.	do.	3	20
Masters, A. C.	Cape Girardeau		14
Miles, John A.	Gray Summit	12	38
Monsees, D. O.	Smithton	17	5
Monsees & Mountjoy	do.	1	30
Moore, W. A.	Cape Girardeau		13
Nenninger, Edward	do.		17
Nichols, Dr. W. J.	Asbury	28	1
Pickens, R. M.	Cape Girardeau		12
Ringwald Bros.	do.		21
Rion, John D.	Farmington	1	17
Romig, Wm.	Dresden	11	19
St. Mary's Seminary	Perryville	13	14
Schonoff, F.	Cape Girardeau	7	12
Selken, Ernest	Smithton	11	19
Shumaker, Peter	Carl Junction		10
Silsby, S. J.	Sedalia	1	15
Smiley, H. H.	Lamonte	2	12
Spaht, Gustave	Albany	10	18
State Hospital No. 1	Fulton	12	92
Stephens, B. D.	Cape Girardeau	1	25
Stupp Farm & Cattle Co.	Pevely	8	124
Sudduth, John	Smithton		10
Waugh Dairy Co.	Marshfield	14	14
Weathers, J. S.	Windsor	22	10
Weissinger, P. H.	Cape Girardeau	2	16
White, C. K.	Smithton	6	5
Wilkerson, J. F., & Son	Marshfield	12	21
Woodward, R. B.	Lamonte	12	15
Wulfers Bros.	Cape Girardeau		20
Young, J. F.	Lees Summit	8	5
MONTANA.			
Arnott, George	Billings		15
Ball, John	Forsyth		43
Barnum, G. E.	Columbia Falls	18	18
Bechtold, August	Butte, 1025 Hornet Street	1	43
Bloom, S.	Simms		26
Boender, Panc	Worden		21
Cramer, A. E.	Belgrade		74
Davenport, C. E.	Hamilton	20	13
Deckert, Fred	Helena		42
Dixon, Joseph M.	Missoula	12	16

HOLSTEIN-FRIESIAN—Continued

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MONTANA—continued.			
Evans, J. A.	Huntley		13
Fenlon, Mrs. Frances	Ballantine		18
Ford & Hollister	Darby	39	
Hall, Louis N.	Drummond	1	15
Helena Holstein-Friesian Co.	Helena	116	40
Hervey, D. C. & L. R.	Billings	16	5
Hoyt, A. J.	Huntley		16
Hunt, Mark.	White Sulphur Springs	18	
Lea, David, & Son	Stevensville	5	23
Mitchell, H. B.	Great Falls	9	198
Montana State Asylum	Warm Springs		152
Moulton, C. H.	Beach, N. Dak., (ranch in Montana)	53	32
Pickens, Plato	Huntley	4	14
Prevost & Scharrer	Rocker	2	48
Siedentorpf, W.	Miles City	1	83
Sherman, A. P.	Forsyth		15
Smith & Abercrombie	Central Park	12	59
St. Joseph's Orphanage	Helena		11
Trump, Otto	Huntley		19
NEBRASKA.			
Abts, M. C.	Columbus	17	14
Andreas, Wm. & John	Beatrice	7	21
Arndt, Wm	Blue Hill	6	4
Barton, Samuel, & Son	Gering	19	5
Benda, Hubert	Shelby	6	3
Bletcher, C. C.	Falls City	1	10
Brandt, H. F.	Beatrice	10	2
Christiansen, G. P.	Saronville	31	1
Dailey, S. O.	Axtel	7	4
Diers, L. H.	Seward	5	
Dole, E. W.	Beatrice	11	4
Doubt & Kingsley	Minden	21	9
Dunn, B. R.	De Witt	14	
Englebrecht, G. F.	Oxford	12	
Feeble Minded Institute	Beatrice	1	49
Frieden, Ben.	Garland	3	43
Fuller, Luther	Hastings	6	9
Grant, R. W.	Beatrice	8	5
Hewit, D. M.	David City	7	2
Hill, Ross	Ellis	10	
Holm, Albert	Colon	16	
Industrial Home of Nebraska	Milford	1	21
Jones, E. H.	Fairbury	8	3
Kempf, R. H.	Shickley	21	1
Kilby, Charles	Pender	1	12
Kilpatric Bros	Beatrice	40	
Lingren, Wm.	Harvard	14	
Lively, C. R., & Son	South Omaha	16	3
Miller, J. M.	Alliance	1	12
Nebraska School of Agriculture	Curtis	17	2
O'Connell, F. J.	Jansen	13	2
Pekarek, A. W.	Brainard	5	3
Peterson, Wm. A.	Harvard	6	4
Ramsey, Shelby	Seward	6	4
Ritchie, C. D.	McCook	23	30
Smith, Virgil, and wife	Emerald	14	
Sollenberger, O. H.	Fairbury	16	
Starke, C. H.	Red Cloud	22	
Swanson, E. C.	Stromsburg	25	
Swanson, F. A.	do.	21	
Swartslev, O. E.	Riverdale	12	6
Tanner, Chas.	Memphis	9	1
Troyer, Al	Shickley	5	11
Van Arsdale, C. H.	Beatrice	13	4
Weibel, H. E.	De Witt	7	1
Woodworth, H. J.	Wahoo	5	5
Wright, L. R.	Gering	7	1
NEVADA.			
Antrim, J. A.	Lovelock		12
Bunkowski, August	Smith		48
Brooks & Peckham	Reno, box 404		154
Brooks, C. W.	do.		18
Burke, A. A.	Reno, care County Hospital		13
Buerer, H. F.	Fallon		27

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NEVADA—continued.			
Carson Indian School.....	Stewart.....	3	16
Dyer, R. C.....	Schurz.....		36
Friedhoff, Geo. W.....	Yerington.....		25
Forsberg & Dunbar.....	Fallon.....	3	47
Gallery, Frank.....	East Fourth Street, Reno.....		11
Heise, F., Land & Live Stock Co.....	Minden.....		12
Honeywell Ranch.....	Wellington.....	6	27
Hunt, J. N.....	Bunkerville.....		10
Hovey, Mrs. Minnie.....	Wellington.....		14
Herricks, Peter.....	Yerington.....		17
Mills, Bert.....	Logandale.....	2	17
Moreira, M. A.....	Lovelock.....		13
McVicar Bros.....	Smith.....		149
McVicar, Geo. C.....	do.....		62
Madelina, E. D.....	Reno, R. 1, box 50.....		23
Olsen, Otto.....	Reno, R. 2, box 48.....		11
Patrick, F. G.....	Reno, box 287.....		13
Pitt, W. C., Ranch Co.....	Lovelock.....		13
Stodieck, Wm.....	Gardnerville.....		47
Settlemyer, Arnold.....	do.....		23
Sebbas, Victor.....	Lovelock.....	4	10
University of Nevada, dairy herd.....	Reno.....	8	10
Wittwer, Wm.....	Bunkerville.....		14
Wainscott, A. R.....	Fallon.....		11
Walbesloh.....	do.....		15
Weidner, J. L.....	do.....		15
NEW HAMPSHIRE.			
Austin, George D.....	Cornish.....	26	
Beaman, W. E.....	do.....	21	26
Blake, H. H.....	Concord.....	16	1
Camp, C. H. & H. N.....	Etna.....	31	
Garipay, Eugene L.....	Hanover.....	6	32
New Hampshire State Hospital.....	Concord.....	11	77
NEW JERSEY.			
Baldwin, Isaac E.....	Stockton.....		12
Harrison, R. S.....	do.....		20
NEW YORK.			
Arnold & Allen.....	Peru.....	12	38
Baker, Gertrude.....	Fulton.....		22
Baker, H. F.....	Richfield Springs.....	30	
Barker, Edwin B.....	Crown Point.....	20	13
Blanchard, C. A., jr.....	Jamestown.....	5	12
Borden Farm Products Co.....	Walden.....		78
Brady, Paul T.....	Pawling.....	35	
Brown, A. B.....	Burlington Flats.....	1	18
Bulson, Claude M.....	Schenevus.....	30	
Capron, R. K.....	Lisle.....	23	
Clark, C. H., & Son.....	Peru.....	40	1
Clark, S. H., & Son.....	do.....	3	26
Cook, Albert F.....	Whallonsburg.....	9	
Cook-Blodgett Farms.....	Denmark.....	30	63
Culver, George D.....	Milford.....	6	57
Coventry, C. J.....	Ransomville.....	8	
Davis, F. M., & Son.....	Livonia.....	22	1
Dennis, L. S.....	Canisteo.....	18	4
Dix, James E.....	Forestville.....	7	
Eldred, Arthur.....	Hartwick.....	6	19
Farrell, Mrs. James.....	Valatie.....	6	7
Flanigin, T. E.....	Hudson Falls.....	8	23
Gleason, A. L.....	Ashville.....	33	
Grace, Joseph P.....	Mahasset.....	4	14
Gregg, W. W.....	Elmira.....	1	19
Green, F., & Son.....	Schenevus.....	2	25
Hilborn, L. E., & H. R.....	Canisteo.....	15	9
Hubbard, George C.....	Red Hook.....	24	
Jackson, J. J., jr.....	South Livonia.....		27
Joslin, M. S.....	Buskirk.....	28	
Kutschbach, R. P., & Son.....	Sherburne.....	43	
Lake Placid Co.....	Lake Placid Club.....	67	183
Loomis, H. C.....	Dryden.....	10	
Loomis, J. R.....	Glens Falls.....	10	51
McClintock, Arthur.....	South Worcester.....	3	39

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Purebred.	Grade.
NEW YORK—continued.			
Markham & Puffer.....	Avon.....	126	36
Martin, Frank.....	Ballston Lake.....	2	10
Masters, F. R.....	Copake Falls.....	24	1
Moore, James O.....	Leicester.....	14	.....
Mott, Carl A.....	Dryden.....	9	5
Mott, O. D.....	Hartwick.....	9	23
Moulton, C. F.....	Cuba.....	2	18
Neilson, Charles W.....	Stillwater.....	9	.....
New York State School of Agriculture.....	Alfred.....	47	.....
Do.....	Canton.....	27	39
Nye, M. B.....	Alden.....	39	3
Orleans County Farm.....	Albion.....	12	12
Ostrander, W. S.....	Schuylerville.....	31	.....
Palmer, Linn.....	Worcester.....	1	14
Potter, E. L.....	Fort Edward.....	17	.....
Potter, L. G.....	Oneonta.....	15	.....
Robertson, W. J.....	Fort Edward.....	.....	19
Robinson, T. D. & D.....	Mohawk.....	5	32
Rowe, L. F.....	Millford.....	28	7
Skellie, A. J.....	Worcester.....	.....	24
Skinner, J. A.....	Westford.....	12	2
Smith, W. J.....	Copenhagen.....	22	.....
Snyder, S. G.....	Worcester.....	11	.....
Stearns, H. B.....	Peru.....	7	.....
Toby, W. A.....	Lindley.....	27	.....
Towsley and Loper.....	Jaspar.....	12	3
Tracy, H. C.....	Massena.....	10	1
Tyler, J. K.....	Worcester.....	14	.....
Vann, Irving D.....	Baldwinsville.....	25	.....
Van Wickle, C. H.....	Geneva.....	16	39
Wait, J. R.....	Auburn.....	43	.....
Wartburg Orphan School.....	Mount Vernon.....	10	.....
Webster, H. R.....	Worcester.....	6	.....
White, R. D.....	Locke.....	18	.....
Whittemore, E. B.....	Argyle.....	1	17
Wieting, C. A.....	Cobleskill.....	.....	45
Willow Brook Dairy.....	Mount Vernon.....	19	36
Wagner, Arthur.....	Richfield Springs.....	15	3
Wood, Mrs. W. A.....	Hoosick Falls.....	4	29
NORTH CAROLINA.			
Bahnson, F. H.....	Farmington.....	1	12
Baird, Thos.....	Asheville, R. 2.....	.....	13
Blake, H. C.....	Wilmington.....	2	31
Bradshaw, C. W.....	Greensboro.....	.....	48
Byorum, E. B.....	Charlotte, R. 3.....	3	9
Carter, H. L.....	Biltmore.....	.....	25
Chilson, Mary.....	Salisbury.....	2	4
Creasman & Haynes.....	Asheville.....	19	4
Deal, A. L.....	Mooresville.....	6	48
De Jong, M.....	Watha.....	.....	23
Deer Park Dairy.....	Biltmore.....	.....	61
Greenwood, Melvin.....	do.....	.....	13
Gregg, J. H.....	West Asheville, R. 5.....	.....	18
Hildebrand, W. A.....	Asheville.....	.....	21
Holcomb, F. L.....	Fayetteville.....	.....	28
Lewis, J. R.....	Walstonburg.....	.....	18
Ludwick, J. F.....	Salisbury.....	13	43
McGinnis, John M.....	Matthews, R. 27.....	.....	20
Mecklenburg County Home.....	Derita.....	2	10
Moody, J. C.....	Charlotte.....	.....	19
Morrison, J. R.....	Statesville.....	4	23
Newman, J. E.....	Pelham.....	.....	13
North Carolina School for Deaf.....	Morganton.....	4	33
Odd Fellows' Orphanage.....	Goldsboro.....	.....	23
Orr, N. J.....	Charlotte.....	.....	51
Oxford Orphan Asylum.....	Oxford.....	6	23
Parker Bros.....	Durham.....	.....	26
Pemberton, Tom.....	Greensboro (Hunter herd).....	.....	18
Robbins, C. C.....	High Point.....	8	21
Rogers & Upchurch.....	Raleigh, R. 5.....	.....	30
Royall, J. L.....	Goldsboro.....	.....	18
Russell, A. C.....	Matthews.....	.....	12
Scarborough, W. V.....	Asheville, R. 1.....	.....	21
Small, Jacob.....	Greensboro.....	.....	18
Smith, Geo. H.....	Asheville.....	.....	17

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH CAROLINA—continued.			
Squires, W. W.	Matthews.	1	14
State Hospital.	Goldsboro.		54
State Normal College.	Greensboro.	7	30
Stevens, J. C.	Biltmore.		14
Stonewall Jackson Manual Training and Industrial School.	Conecord.	2	23
Stradley, H.	Asheville, R. 1.		11
Thomasville Baptist Orphanage.	Thomasville.	13	49
Vanderwal, S.	Wilmington.	33	
Weir & Dockery.	Asheville, R. 5.		45
Weir, H. M.	Asheville.		27
Wells, J. S.	Leicester.	1	21
Winston-Salem Live Stock & Dairy Co.	Winston-Salem.		63
Wolf, J. W.	Asheville.		14
NORTH DAKOTA.			
Albertson, A.	Fargo.		15
Anderson, A. I.	Wild Rice.	1	23
Anderson, J. J.	Sheldon.		11
Anderson Bros.	Plumer.	2	10
Barnes, A. H.	Fargo.		36
Benjamison, M.	Mountain.	1	12
Berquam, O. O.	Grafton.		11
Bogus, John.	Bowbells.		16
Bratzel, Phillip, jr.	Hebron.	10	19
Carlson, Hans.	Enderlin.		22
Chilberg, Ray.	Valley City.		44
Christie, Ed.	Danzig.	6	15
Cole, J. D.	Grand Forks.	30	22
Cotner, C. L.	Flasher.	1	15
Dahlbeck, J. P.	Oakes.		32
Deming, C. F.	Warwick.		23
Franks, Chas. O.	Devils Lake.	1	11
Goeltertz, W. C.	Kintyre.	1	18
Golberg, S. S.	Harvey.	1	35
Grabenhorst, W. J.	Flasher.		16
Groth, J. P.	Enderlin.	1	16
Gustenshon, Theodore.	Havelock.	8	1
Haneock, W. B.	Pembina.	8	
Havens, L. A.	Lark.	2	15
Hedland, A. O.	Fargo.		10
Hegranes Bros.	Grafton.		18
Hexom, John.	Wild Rice.	22	
Holding, A. C.	Cayuga.	6	
Holle, C.	New Salem.	5	8
Hollingshead, Al.	Oriska.	1	23
Horner, E. A. & G. E.	Finley.	8	
Johnson, Olaf P.	Wahpeton.	1	16
Jones, John R.	Hankinson.	10	
Jordan, A. C.	Driscoll.	1	20
Kelley, Thos.	Colgate.	12	5
Kerdell, C.	Mandan.		24
Klusman, Charles.	Youngstown.	25	
Klusman, Henry.	New Salem.	4	15
Krantz, August.	Kenmare.		12
Kroeger, F. W.	Youngstown.	1	15
McDonald, A. W.	Valley City.		18
Michigan Mercantile.	Michigan.		23
Morton, S. W.	Driscoll.		10
Motsiff, S. F.	Mandan.	1	15
Nootnagle, Ed.	Devils Lake.		10
Agricultural College.	Agricultural College.	18	4
State Prison.	Bismarek.		72
Reform School.	Mandan.	1	29
O'Connor, Larry.	Grand Forks.	12	9
Olson, C. A.	Milton.	1	34
Osborn, W. E.	Dazey.	11	3
Otto, Fred.	Hillsboro.	2	12
Payne, James.	Knox.	1	20
Payne, P. O.	Argusville.	1	11
Regstad, Chris.	Esmond.	5	16
Reiersen, Martin.	do.	4	14
Reinoehl, F. J.	Larimore.		15
Richland County Poor Farm.	Wahpeton.	10	2
Riedesel, Lewis.	Cathay.		13
Sawyer, M. I.	Driscoll.		19

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH DAKOTA—continued.			
Schebler, Chas.	Bismarck.		17
Scheffert, L. J.	Michigan.		11
Seiler, O. J.	Jamestown.	3	18
Severtson, S. O.	Esmond.	1	12
Shaud, J. E.	Schafer.		12
Sheard, H. E.	Cathay.	1	15
Smith, D.	Devils Lake.	2	17
Smith, Emerson H.	Fargo.	3	15
Sorensen Bros. & Challey.	Webster.	19	4
State Substation.	Hettinger.	9	
Stensrude, Ole.	Flaxton.	17	
Tellman, Ed.	Youngstown.	19	
Tuttle, C. E.	Donnybrook.	1	13
Van Steuart, Constant.	Devils Lake.	1	14
Vogel, Wm.	Lark.	4	22
Westad & Peterson.	Maddock.		10
Westley, Hans.	Cooperstown.	9	5
Wiebers, F. H.	Flasher.		11
Wilkinson, M. E.	Jessie.	8	7
Wolter, Henry.	Hebron.	6	25
Wyckoff, W. W.	Embden.		41
Yedstey, Peter.	Cummings.		11
OHIO.			
Allen, Bruce H.	Morenci, Mich., farm, Fulton County, Ohio.	5	
Allyn Estate.	Hiram.	3	16
Ames, Vern E.	Bryan.	8	1
Andrus, F. M.	Ashtabula.	9	16
Ansted, R. E.	Monclova.	23	7
Armstrong, Claude.	Austinburg.	24	
Ash Bros.	Ada.	7	1
Athens County Children's Home.	Athens.	11	9
Babst, Daniel.	Crestline.		10
Bacon & Son, Geo. H.	Vermilion.	3	13
Barlow, Dr. Page.	St. Clairsville.	14	
Bates & Son, F. A.	Wauseon.	6	17
Bax, William.	Mount Healthy.	6	14
Baxter, E. O.	West Farmington.	2	8
Beal, Joe.	Wellington.	15	3
Beal, P. C.	do.	2	11
Beilharz, H. L.	Liberty Center.	2	10
Bemenderfer, H. K.	Bloomville.	19	7
Bender, W. H.	Wauseon.	7	14
Bettinger, Leo.	Berkey.	3	2
Biehler, C. P.	Rockyridge.	6	8
Bishop, C. E., & Morgan, J. A.	Peninsula.	30	
Bixler, Noah.	Orrville.	10	
Bixler, William.	do.	7	
Blosser, J. M.	Rawson.	4	3
Bockelman, Carl.	Napoleon.	7	1
Boerger, C. J.	Marysville.	9	
Boger, Guy H.	Lyons.	7	14
Bokerman, George.	Napoleon.	1	10
Bonte, Michael.	Fayette.		13
Boyes, John.	Lyons.	7	6
Bowles, J. E.	Athens.	1	28
Bowman & Son, C. E.	Berlin Center.	17	21
Bratton, C. F.	Delta.	5	3
Breice, Henry.	Tallmadge.		13
Briggs, C. L.	Lodi.	6	2
Britsch, Adam.	Pettisville.	2	6
Brown, H. O.	New Springfield.	12	24
Brown, Jed.	Vermilion.	9	1
Brown & Meyers.	Napoleon.	8	29
Buchman, F. L.	Tiffin.	12	11
Buckwalter, A. M.	Dalton.	15	
Buell, Carl.	Litchfield.	3	13
Burekhardt, C. M.	Orrville.	6	2
Burgbacker, H. F.	Bryan.	16	3
Burke, J. M.	Wakeman.	2	8
Burkholder, A. E.	Wauseon.	5	
Burkholder, Sam.	do.	14	
Burnham, F. W.	Conneaut.	5	14
Butdorf, F. D.	Creston.	1	16
Caris, Frank.	Rockyridge.	1	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
Case, Harry.....	Hudson.....	46	6
Castle, C. O.....	Swanton.....	1	5
Caulkins, Chas.....	West Unity.....	16	
Chambers, S. S.....	Grove City.....		38
Chitwood, W. R.....	Dayton.....	6	
Churchill, O. B.....	Cortland.....	19	4
Circle "W" Farm.....	Gates Mills.....	7	
Clapp & Malloy.....	Hiram.....	18	3
Clemson, Albert.....	Chardon.....	15	
Cockley, W. B.....	Lexington.....	21	1
Collins, Fred.....	Berkey.....	4	3
Cook, William F.....	Hudson.....	59	4
Cox, Robert.....	Dorset.....	15	
Crabb, Geo. E.....	Toledo.....	14	1
Crawford, Earl.....	Napoleon.....	2	8
Crile, M. A.....	Fresno.....	27	
Curth, S.....	Nankin.....	6	
Dague, George M.....	Spencer.....	10	3
Daisy Hill Farm.....	Chagrin Falls.....	95	2
Davidson, W. D.....	Marathon.....	23	
Davis, J. Harry.....	Williamsfield.....	13	
Dean, Arthur.....	Blacklick.....		16
Dean, Samuel.....	do.....		25
Dilley, A. E. & J. P.....	Cortland.....	12	6
Drewes, W. D.....	Napoleon, R. 4.....	7	
Dubach Bros.....	Ashtabula.....	1	30
Dusenberry, A. B.....	Chesterland.....	22	
Egbert, J. H. & J. L.....	Everett.....	20	
Eicher, Henry.....	Archbold.....	9	
Elder, L. G.....	Cortland.....	1	25
Eldridge, O. M.....	Wauseon.....	6	12
Enlow, D. S.....	Akron.....	3	9
Farison, Guy.....	Malinta.....	5	1
Farris, W. J.....	Akron.....	9	14
Fay, M. O.....	Wakeman.....	7	7
Fay, Thomas.....	do.....	6	11
Fee & Son, W. A.....	Cortland.....	27	
Feiszl, John.....	Vermilion.....	11	2
Figy, Charles.....	Napoleon.....	6	6
Fisher & Son, H. K.....	Fostoria.....	3	9
Foos Farm.....	South Charleston.....	101	
Forest & Kline.....	Wauseon.....	5	3
Fouty, Grant E.....	do.....	5	
Frederick & Van Schoik.....	Ashtabula.....	16	9
French Bros.....	Andover.....	18	1
Garrow, John A.....	Morenci, Mich.; farm, Fulton County, Ohio.....	21	
Geiger, Walter.....	Pandora.....	3	3
George, C. F.....	Okeana.....	3	5
Gerber, Joseph.....	Sugarcreek.....	22	2
Givens, Roy J.....	Bellaire.....		11
Gless, Peter L.....	East Akron.....	2	13
Gongler, Charles E.....	do.....		18
Good, Charles.....	Sandusky.....	3	11
Green County Infirmary.....	Xenia.....		12
Greenlee, John J.....	Bridgeport.....		27
Gregg, Harry.....	Wellington.....	12	
Griffin, Bayliss.....	Sylvania.....	21	
Griffin & Jones.....	Fayette.....	1	19
Grisier & Robinson.....	Wauseon.....	22	
Hall & Son, William.....	Tiffin.....	10	
Hallier, George.....	Oakharbor.....	2	6
Harmon, H. E.....	Leipsic.....	9	
Harris, Mrs. T. J.....	Huron.....	6	1
Harroun Bros.....	Sylvania.....	33	
Hartzler, C. F.....	Wellersville.....	14	4
Haskins, G. B.....	Wakeman.....	5	5
Hastings, Merle.....	Wellington.....	2	4
Havens, Willis B.....	Fremont.....	5	10
Hawkins, G. C.....	Morenci, Mich.; farm, Fulton County, Ohio.....	27	
Hay, Charles.....	Findlay.....	44	
Hazen, A. F.....	Alliance.....	8	11
Hendricks, E. M.....	Napoleon.....	3	10
Herbruck Bros.....	Cuyahoga Falls.....		21
Herring, Leroy L.....	Oakharbor.....	2	7
Hilty, Philip.....	Bluffton.....	3	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
Hinderer & King.....	Archbold.....	18	.....
Homan, H. F.....	Wauseon.....	13	.....
Homegardner, Geo.....	Sandusky.....	8	15
Hoover, W. O.....	Hiram.....	32	.....
Horr, C. W.....	Wellington.....	54	3
Huffman, G. W.....	Columbus.....	5	.....
Hughes, Jason.....	Maumee.....	1	5
Hutchins & Saylor.....	Delta.....	8	10
Iler, Lem C.....	Findlay.....	4	9
Iuen, James.....	Terrace Park.....	7	12
Johnson, W. A.....	Bellaire.....	1	7
Jones, J. L.....	Wellington.....	13	6
Jones, L. L.....	Fremont.....	11	2
Jones, Oscar.....	Edenton.....	12	2
Judson, S. E.....	Kent.....	5	9
Kalber, Albert.....	Bryan.....	6	.....
Keener, A. F.....	Swanton.....	15	1
Keener & Mohr.....	do.....	.....	13
Keller, A. E.....	do.....	10	4
Keough, William.....	Delta.....	5	3
King, Christ J. & Irene.....	Orrville.....	11	5
Kingsley, Wm. N.....	Hartville.....	8	13
Kittle Bros.....	Holland.....	35	.....
Kittleberger, J. B.....	Akron.....	.....	17
Kryder, G. H.....	Louisville.....	11	4
Lampman, J. C.....	Chardon.....	11	.....
Langdon, W. E.....	Grove City.....	4	6
Lathrop, Jerome B.....	Berkey.....	12	4
Lathrop, L. A.....	Sylvania.....	1	16
Lawrence, C. W.....	Springfield.....	4	9
Leadrach, R. W.....	Vermilion.....	18	1
Leatherman, H. J.....	Colton.....	4	11
Leatherman, W. D.....	do.....	3	14
Lemert, W. W.....	Napoleon.....	1	12
Leow, Emery C.....	Oakharbor.....	9	.....
Lewis, M. E.....	Swanton.....	9	6
Lockwood, H. J.....	Oakharbor.....	2	4
Loehr, E. C.....	Medina.....	2	4
Logan, Victor.....	Kinsman.....	8	16
Longworth, George.....	Felicity.....	4	15
Lozier, John.....	Wauseon.....	.....	10
Luther, H. R.....	Peninsula.....	15	.....
McCann, Dr. T. A.....	Dayton.....	6	.....
McClelland, O. C. & A. R.....	Newark.....	14	1
McCloy, A. C.....	Bridgeport.....	.....	11
McCombs, F. J.....	Warren.....	22	5
McCool, J. H.....	Covington.....	9	.....
McElheny & Bunn.....	Tiffin.....	.....	10
McDonald, A. A.....	Wakeman.....	6	2
McQuillin, George R.....	Swanton.....	13	.....
McMahon, J. C.....	Clyde.....	7	1
Mason, C. C.....	McClure.....	6	5
Medina Infirmary.....	Medina.....	29	.....
Meteor, J.....	Columbus.....	11	.....
Meyer, G. Fred.....	Napoleon.....	22	.....
Miller, C. I.....	Medina.....	12	1
Miller, Hon. C. K.....	Fayette.....	12	3
Miller, D. K.....	Austinburg.....	3	3
Miller, Sam A.....	Swanton.....	4	7
Miller & Son, C. E.....	Liberty Center.....	4	.....
Millikin & Son, R.....	Cortland.....	14	.....
Monck, S. J.....	Painesville.....	15	8
Morley, T. D.....	West Mentor.....	28	.....
Myers, C. M.....	Wellington.....	7	4
Myers, H. J.....	Wauseon.....	3	7
Myers, J. G.....	Berkey.....	7	.....
Newlon, Guy A.....	Newton Falls.....	23	2
Nichols, C. P. & C. H.....	Mantua.....	15	.....
Nofziger, Simon.....	Stryker.....	5	4
Nofzinger, Jacob A.....	Elmira.....	3	5
Norton, H. F.....	Wauseon, R. 5.....	9	1
Oberhaus, J. F.....	Napoleon.....	.....	14
Ohio Soldiers' and Sailors' Orphans' Home.....	Xenia.....	3	55
Owens, Cecil.....	West Farmington.....	8	2
Peck, Frank H.....	Amherst.....	14	9
Pfaff, Albert.....	Swanton.....	7	5

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
Pfaff, F. G.	Delta.	2	5
Pfouts, G. O.	Chagrin Falls.	7	1
Pierce & Haughton.	West Farmington.	13	3
Pinkelman, H. L.	Sylvania.	4	9
Pittman, George.	McClure.	10	2
Plassman, C. H.	Napoleon.	1	5
Pontius, H. M.	Liberty Center.	2	11
Prindle, J. J.	Westview.	17	
Reece, C. S.	Wooster.	7	
Renner, J. A.	Garrettsville.	4	6
Rickenberg, Fred H.	Napoleon.	3	4
Robasser, Vern.	Swanton.	1	6
Robinson, O. L.	Medina.	8	
Rohrs, John.	Napoleon.		11
Roice & McQuate.	Wellington.	30	12
Roth, Fred.	Archbold.	9	5
Rudibaugh, Adam.	Leetonia.	17	
Ruebush, C. W.	Dayton.		17
Rupp, Ralph.	Archbold.	11	
Russell & Mohler.	Liberty Center.	4	8
Rychener, Elmer.	Archbold.	20	1
Scales, J. G.	Hudson.	5	1
Schumucker, J. W.	Archbold.	5	6
Schneidhorst, R. G.	Lockland.	13	2
Schuette, Herman.	Napoleon, R. 4.	4	1
Schumacher, Wilbert & Amos.	Bluffton.	11	
Schutz, Hiram.	Pandora.	6	
Scott, L. H.	Alexandria.	9	28
Seabold, John.	Grafton.		10
Seiberling & Sauer.	Barberton.	33	
Seiberling, Walter.	do.	11	
Sharp, P. D.	West Liberty.	5	
Sharp, W. H.	Sugar Grove.	11	
Sherod, J. L.	Vermilion.	19	4
Slagle, C. F.	Napoleon.	4	9
Smith & DeFields.	Wellington.	11	7
Smith, J. Frank.	Lake.		15
Snow, Arthur.	Bryan.	8	3
Snyder, W. H.	Napoleon.	17	5
Sonnenberg, C. F.	do.	6	2
Sonnenberg, G. H.	Holgate.	2	4
Sonnenberg, Theo.	do.	2	4
Sorg, H. A.	Oakharbor.	2	6
Sower, A. B.	Fayette.	14	
Spencer, A. L.	Wauseon.	1	20
Spring & Porter.	do.	17	
Starr, W. T.	Wellington.	28	1
Steensohn, Earl.	Archbold.	4	8
Steigerwalt, E. A.	Wadsworth.		11
Steiner, Fred J.	Massillon.	14	13
Steiner, William.	do.		11
Stern, E. H.	do.	13	2
Stevens, Elmont.	Rutland.	2	9
Stevenson, W. H.	Wellington.	18	7
Steward & Clapp.	Liberty Center.		16
Steward & Son, G. M.	do.	3	23
Stewart, George R.	St. Clairsville.		10
Stillson Bros.	Kent.	10	4
Stone, W. D.	Nova.	24	5
Stong & Egnew.	Lyons.	9	
Struble, C. E., & Connell, L. E.	Grelton.	12	
Sunbury, Thad.	Farmdale.	20	
Trinter, Wm.	Vermilion.	4	8
Trumbull County Experiment Farm.	Cortland.	2	15
Turner, Mathias.	Unionville.	19	1
Vogle, A. B.	Oakharbor.	5	5
Walcutt, R. N.	Sycamore.	9	
Walker Bros.	Athens.	2	35
Wasson, J. M.	Austintburg.	5	31
Weber, John.	Wauseon.	3	14
Weichers, H. F.	Napoleon, R. 4.	2	5
Weiss, George.	Rogersville.	26	
Willerton, F. G.	Bellaire.	12	9
Willson, H. E., & S. V.	Delta.	10	
Wise, John A., & Son.	Bellaire.		19
Wolter, Carl W.	Oakharbor.	3	4
Woodford, B. D.	Mesopotamia.	6	7

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
Woolever, A. C.	Austinburg.	1	26
Wright, Alfred	Sandusky		23
Wright, J. A., & Adams, Robert	Liberty Center	1	8
Wright & Schwartzlander	do.	12	10
Wyse, Dan E.	Archbold.	4	6
Yaussy, John G.	Bucyrus	23	2
Yaussy, Otto	do.	10	
Yingling & Son, Chas.	Oakharbor	1	7
Yoder, John Z.	Wauseon	16	
Zeigler, George M.	Fayette	15	1
Zimmerman, George	Wauseon	17	
OKLAHOMA.			
Allen, George	El Reno.		12
Agricultural and Mechanical College	Stillwater	14	
Blake, Ed E.	El Reno.		36
Garrett, H. T.	Elmwood	1	14
Kayser, C. E.	Bartlesville.	17	16
Kennedy, J. M.	El Reno.		26
Lessenger, C. M.	Oklahoma.	14	24
Mier, David	Hitchcock	15	41
Mohinke, L. T.	El Reno.	5	33
Murray State School	Tishomingo.	6	16
Pontius, J. C.	Yukon	36	5
Ryan, Martin V	Kremlin	5	7
Schmidt, Chas., jr	El Reno.	1	25
Spriggs, S. O.	do.	1	29
Tate, H. H.	do.		27
Thompson, G. R.	do.	1	26
Worthington, Chas. W.	do.		39
OREGON.			
Anderson, Ernest	Astoria		25
Barendse, J. W.	Blind Slough		29
Bates, E. G.	Warrenton		14
Benter, Adolph.	Goshen	10	12
Berning Bros.	Mount Angel.	22	
Bray, William M.	Klamath Falls	38	
Carlson, Arvid	Astoria		21
Carmichael, Thomas	Gaston		27
Cornelius, C. W.	Portland		13
Eilers, Uly	Aurora	11	
Gustason, Jacob	Astoria		14
Jocelyn, William	Boring		13
Klamath Indian School	Klamath Agency		19
Klein Bros	Silverton	12	
Kuenzi, Herman	do.	17	
Lundman, Jalmar	Astoria		1
McCall, Henry	Prineville	36	
Magee, C. S.	McMinnville	10	
Paget, L. L.	Gaston	22	
Platt, Walter F.	Springfield	13	
Phy, Dr. W. T.	Hot Lake	21	
Sale Bros.	Astoria		19
Salem Indian School	Chemawa		20
Sales, J. F.	Astoria		34
Scharen Bros.	Creswell.	9	9
Seppa, Mike	Astoria		35
Strucken, John	Portland	13	
Tagg, Harold	Warrenton		16
Thurston, B. S., & Son	Jefferson		16
Tokelson, M.	Prineville.		11
Umatilla Indian School	Pendleton		17
Watson, Fred	Olney.		14
Wilson, T. E.	Astoria		27
PENNSYLVANIA.			
Alcorn, A. W.	Titusville		11
Allison, E. Page	West Chester, Town's End Farm	22	8
Antes, Philip C.	Williamsport, R. 2, Garden View Farm	12	2
Armour, W. J.	Grove City	3	16
Armstrong, Miss Lida	do.	3	11
Bache, Wm.	Wellsboro.	1	24
Bailey, Dwight H.	Mansfield	12	17
Bailey, John W.	Tioga	28	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
PENNSYLVANIA—continued.			
Bailey, W. A., & Son.	Dimock.	23	
Baker, Guy.	Dushore, Maple Grove Farm.	4	15
Barnes, Geo. D.	Grove City.	5	
Beatty, A. H.	Grove City, R. 13.	1	14
Bennett & Latzer.	Willsboro.	79	
Bray, Chas. W.	Bridgeport, R. 1, Bellwood Farm.	49	
Brown, J. G.	Titusville, R. 5.		10
Burger, R. A.	Titusville, star route.		13
Carpenter, A. B.	Wellsboro, R. 4.	11	14
Chambers, H. B.	Mahoningtown, R. R.	16	18
Chapin, E. W.	Enon Valley, R. 2.	1	28
Craig, John H.	Edinburg.	5	9
Childs, J. J.	Titusville, R. 2.		16
Christy, D. S.	Tarentum, R. 2.	8	5
Clement, Thomas.	Lincoln University.	17	
Cooper, Clyde C., & Son.	Sugargrove.	7	3
Courtney, Geo. F.	Mercer, R. 6.	5	9
Courtney, James P.	do.		10
Davidson, Wm G.	Albington, Brentwood Farm.	63	
Davis, A. P.	Westfield, R. 2.	12	
Davis, Geo. N., & Son.	do.	8	22
Davis, J. H.	Edinburg, R. 2.	12	6
Decker, C. C.	Smethport, R. 3.	4	18
Decker, G. Fulmer.	South Montrose, Edgwood Stock Farm	18	
Dempsey, R. J.	Dushore.		15
Donaldson, Geo. W.	Jackson Center, R. 19.	1	13
Donaldson & Wilson.	Midway.	20	
Drew, Charles D.	Mansfield, R. 1.	5	9
Dunham, Wm.	Tioga, R. 1.	3	18
Dunlap, L. E.	Meshoppen.	14	5
Eddy, M. M.	Tryonville.		10
Elde, J. B.	Volant, R. 3.	21	
Ellsworth, H. E., & Son.	Meshoppen, R. 5.	26	
Ely, Dr. Geo. W.	Bridgeville, R. 3.	6	4
Evans, David L.	Crooked Creek, R. 1.	2	10
Fletcher, W. H., & Son.	Wellsboro, R. 3.	2	17
Fogal, Gustus.	West Middlesex.		13
Forbes, H. L.	Sandy Lake, R. 25.	3	18
Forrey, H. N.	York.	21	2
Gates, H. C.	Canton.	26	
Gorham, F. W.	Wysox.	24	4
Hays, E. H.	Imperial, R. 1.	18	
Holmes & Gilfillan.	Smethport.	37	
Horton, Crary & Co.	Warren.	49	
Howell, E. C.	Wellsboro, R. 3.	12	
Hunter, James W.	Grove City.	35	
Ideal Squab Co. (Inc.).	Butler.	22	1
Kays, G. B.	Lewistown, R. 2.		13
Kennedy, W. B.	Wyalusing, R. 1.	14	25
Kerr, Nathan.	Kingsville.	1	12
King, M. M.	Mercer, R. 2.	11	10
Knauff, Jacob F.	Mercer, R. 6.	4	11
Lane, Arthur.	Westfield, R. 2.	1	21
Lathrop, W. A., Estate.	Montrose, R. 6.	28	1
Leslie, J. Chas.	New Galilee, R. 1.		11
Lotz, A. W.	Rochester, R. 1.		14
Luzerne County Industrial School for Boys.	Kis-Lyn.	56	
Lyman, A. R.	Meshoppen, R. 4.	3	45
Lytle, L. E.	Jackson Center, R. 20.	5	11
McBride, G. C.	New Galilee, R. 3.	3	15
McCamant, J. M.	West Chester.	13	
McCracken, J. P.	Brookville.	8	
McIntire, G. W.	Mercer, R. 1.	5	10
McKean, J. A. & E. B.	Smethport.	25	1
McKee, I. H.	Grove City, R. 13.		11
Manning, L. R.	Tioga, R. 4.	17	17
Markley, F. J.	Tryonville, Woodland Farm.		18
Maryatt, F. A.	Townville, Highland Home Farm.	1	13
Maryott, L. H.	Townville.		11
Miller, B. S.	Slippery Rock, R. 3.	17	24
Minor, O. S.	Volant, R. 1.	3	21
Mollenauer, E. P.	Canonsburg, R. 1.	11	3
Morgan, Reese.	South Montrose.	6	9
Mrozek, Joseph.	Mahoningtown, R. 8.	10	16
National Farm School.	Farm School.	23	11

Tuberculosis Eradication under the Accredited-Herd Plan. 47

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
PENNSYLVANIA—continued.			
Oesterling, Elias, & Son.....	Butler, R. 8.....	2	21
Paulhamus, H. R.....	Hepburnville.....	24	.....
Payne, E. J.....	Jackson Summit.....	5	40
Peebles, T. V.....	Titusville.....	.....	12
Phillips, G. I.....	Alexandria, R. 1.....	4	21
Ralston, Harry.....	Butler, R. 1.....	23	1
Reddick, H. M.....	Slippery Rock, R. 5.....	3	18
Roberts, C. E.....	Wyalusing, R. 1.....	10	5
Rohe, G. Ralph.....	Dushore, R. R., Keystone Stock Farm	3	12
Rosettie, Daniel.....	Wellsboro, R. 4.....	1	13
Schreiner, F. T.....	Titusville.....	.....	12
Scott Bros.....	Corapolis, R. 2.....	9	9
Scott, Chas. W.....	Oakdale, R. 1.....	5	17
Shaffer, J. H. & H. L.....	New Castle, R. 2.....	6	16
Shaw, Albert L.....	Tioga, R. 4.....	4	11
Smith, W. N.....	Millerton, R. 1.....	9	11
Spencer, F. A. & J. J.....	do.....	13	25
Stahlman, S. J.....	Brookville, R. 6.....	8	3
State Hospital for Insane.....	Warren.....	66	100
Stevens, Roy.....	Rutland, R. 1.....	6	18
Stoner, Robert B.....	New Castle.....	7	4
Stewart, L. J., & Sons.....	Imperial.....	37	1
Swisher, Chas. P., & Son.....	Christiana, R. 1, Sunny Banks Farm..	3	12
Thompson, G. Clyde.....	Chambersburg, R. 10.....	6	.....
United States Army General Hospital 31.	Carlisle.....	1	47
Wagner, Mrs. F. W.....	Titusville, R. 4.....	.....	18
Wahl, Fred M.....	New Brighton, R. 2.....	.....	16
Welch, M. Reed.....	Burgettstown.....	10	1
Wenrich, Reuben D.....	Wernersville, Grand View Farm.....	40	.....
Wetzel, C. A.....	New Castle, R. 3.....	2	17
White, J. P.....	Hickory, R. 1., Hughes Hill Farm.....	21	8
White, Thos. C.....	Westford.....	31	15
Wishart, J. R.....	Sharpsville, R. 56.....	18	39
RHODE ISLAND.			
Ayers, H. B.....	Westerly.....	68	1
Singleton, Ernest.....	Woonsocket.....	14	.....
SOUTH CAROLINA.			
Burgess, C. C.....	Greenville.....	.....	43
Campbell, C. C.....	do.....	.....	12
Gardner, J. K.....	Hartsville.....	.....	33
Hinton, J. H.....	Greenwood, R. 4.....	13	13
Jeter, W. H.....	Carlisle.....	1	13
McCravy, S. T.....	Spartanburg.....	6	10
Mayfield, J. K.....	Denmark.....	61	19
Mobley, W. A.....	Johnston.....	.....	11
Patton, F. G.....	Charleston.....	13	.....
Ravenel, Rene.....	do.....	2	38
Sahlman, L.....	do.....	.....	61
South Carolina Sanatorium.....	Columbia, R. 3.....	1	14
Spencer, A. E.....	Clinton.....	5	17
Wells, C. L.....	Greenwood.....	.....	37
SOUTH DAKOTA.			
Ardmore Experiment Station.....	Ardmore.....	16	12
Brown, M. E.....	Groton.....	3	10
Casey, M. H.....	Madison.....	.....	11
Cleveland, Robt. A.....	Hetland.....	13	.....
Crow Creek Indian School.....	Fort Thompson.....	1	21
Eaton, J. M.....	Bellefourche.....	4	28
Erwin & Stevenson.....	Groton.....	19	13
Gage & Kurtz.....	do.....	32	.....
Howell, O. Everett.....	Florence.....	9	4
King, Ed.....	Clark.....	4	13
King, John E.....	do.....	9	26
Lagerquist, S. A.....	Lantry.....	3	8
Lowthoam, W. J.....	Milbank.....	2	11
March, J. J.....	Hot Springs.....	1	40
Miller, Paul.....	Willow Lake.....	4	8
Nissen, Peter.....	St. Onge.....	13	30
Olson, B. O.....	Naples.....	6	2
Schmidt, H. H.....	Madison.....	4	7
South Dakota School for Deaf Mutes.....	Sioux Falls.....	19	.....

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
SOUTH DAKOTA—continued.			
State Soldiers' Home.....	Hot Springs.....	1	18
State Sanatorium for Tuberculosis.....	Custer.....	11	8
Sunday, James.....	Madison.....	4	18
Thompson, Theo. H.....	Astoria.....	64	-----
United States Indian School.....	Rapid City.....	5	33
Youngquist, A. G.....	Watertown.....		12
TENNESSEE.			
Allen, W. N.....	Bartlett.....		20
Banks, King.....	Rains.....	36	-----
Baseheart, J. A.....	Winchester.....	14	1
Brewer, I. A.....	Union City.....	6	14
Chase & Mullins.....	Lucy.....	3	24
Clark, R. M.....	Winchester.....	8	10
Cleveland, R. L.....	Whitehaven.....		10
Clifton, H. G.....	Bartlett.....	3	29
Crump, D. H.....	Memphis.....	12	17
Cunningham, Frank.....	Clarksville.....	7	1
Dale Bros.....	Nashville, R. 3.....	16	3
Farrell, J. O.....	Buntyn.....		10
Ferguson Farms.....	Dyersburg.....	56	-----
Henderson, Elmer.....	Bartlett.....	19	17
Lea, T. O.....	Brownsville.....	5	25
Neergaard, J. T.....	Kingston.....	2	23
Moinette, A. L.....	Winchester.....	6	6
Paty, C. E.....	Memphis.....		35
Peek, W. L.....	Whitehaven.....	15	14
Perry, E. F.....	Memphis.....	20	28
Phelan, Mrs. A. R.....	Raleigh.....	3	32
Pressman's Home.....	Rogersville.....	23	9
Schaefer, Frank.....	Winchester.....	8	1
Tenn. School for Deaf and Dumb.....	Knoxville.....	6	15
Western Hospital for Insane.....	Bolivar.....	1	30
TEXAS.			
Flowerdale Farm.....	Dallas.....	25	-----
UTAH.			
Adamson, Davis.....	Alpine.....		12
Andreasen, Hans.....	Provo.....		16
Atkinson, J. I.....	Woods Cross.....	18	8
Atwood, E. A.....	Sandy.....	2	8
Baker, M.....	Ogden.....		15
Bennett, Geo. H.....	Layton.....		12
Bennett, F. P.....	Kaysville.....		11
Bennett, Chas.....	do.....		16
Benson, J. Perry.....	Woods Cross.....		17
Bodily, J. E.....	Layton.....		11
Boyce, Peter.....	Provo.....		34
Bringinghurst, L. Scott.....	Murray.....	24	12
Broadbent, J. T.....	do.....		16
Buckway, Tom.....	Ogden.....		10
Cahoon, Roy.....	Woods Cross.....		22
Cardon, A. F.....	Logan.....	16	7
Carlisle, Tom.....	Alpine.....		12
Chakos, Geo.....	Provo.....		27
Cherry Hill Dairy.....	do.....	12	33
Clegg, Lewis & Joy.....	do.....		23
Clark, E. B.....	Farmington.....		23
Clark, H. D.....	do.....		11
Clark, E. H.....	do.....		15
Cowan, Richard.....	Ogden.....		13
Cowan, Lewis.....	do.....		17
Crane, H. S.....	Riverton.....		16
Criddle, Wm.....	Layton.....	6	12
Dittmore, Geo.....	Pleasant Grove.....		21
Doughigery, Stavous.....	Salt Lake City.....		16
Erickson, J. B.....	Murray.....		10
Fillerup, Andrew P.....	Provo.....		24
Fowlks, J. W.....	Murray.....		17
Frahm, J. H.....	do.....		15
Gammon, Harry.....	Vineyard.....	2	21
Godfrey, Horace T.....	Murray.....		11
Graham, A. J.....	Alpine.....		13
Gurney, Wm. F.....	Lehi.....		12

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
UTAH—continued.			
Hatch, Wilfred	Woods Cross		13
Hatch, Gilbert	do		13
Hatch, Glenn	do		10
Hatch, Jno. I.	do	5	9
Hatch, E. T.	do		15
Hatch, Ansel	do	14	20
Harding, Jesse	Provo		13
Harding, Roy	do		10
Hansen, H. P.	Layton		17
Hn ckley, L. N.	Provo		14
Hoggan, Walter	Woods Cross		13
Holdaway, Elmer	Provo	44	4
Holdaway, Albert	do		22
Holdaway, W. R.	do	23	21
Hoiby, H. C.	Ogden		28
Holwe, H. E.	Murray		49
Larsen, Dan	Provo		14
Lloyd, E. G.	Murray		17
Lloyd, M. G.	Provo		10
McKay, T. E.	Huntsville		12
McQuarrie, D. S.	Woods Cross		16
McQuarrie, Paul	do		12
Madsen, J. J.	Provo		13
Maddock & George	Salt Lake City		87
Marrott, W. A.	Pleasant Grove		22
Marrott, Clarence	do		20
Minor, M. O.	Provo		11
Maag, Con	do		10
Moffat, J. F.	Murray		10
Morrell, J. W.	Logan		16
Moss, Dan	Woods Cross		11
Nielsen, A. P.	Riverton	9	
Olsen, Alma	Logan	8	
Parkin, H. G.	Woods Cross	7	6
Powell, T. E.	Ogden		14
Pulley, Andre	American Fork		16
Rawlings, Mary	Provo		11
Ritchie, Lawrence	Ogden		10
Roberts, Emil	do		15
Robinson, J. B.	Salt Lake City		19
Rice, L. S.	Farmington		12
Schenk, J. H.	Logan		10
Shumway, Bradford	Provo		24
Satson, C. E.	Alpine		10
Sjoblom, Andrew	Riverton		17
Shaw, Geo. F.	Murray		11
Smith, G. F.	do		10
Snape, Jas.	American Fork		11
Stone, A. H.	Salt Lake City		102
Stubbs, Jno. W.	Charleston	22	
Swanson, C. E.	Harrisville		14
Taylor, Geo. P.	Ogden	4	30
Taylor, L. J.	do		14
Taylor, A. W.	Harrisville		13
Thompson, J. T.	Murray		23
VERMONT.			
Anderson, L. H.	West Glover	15	2
Atkinson, Earle	Plainfield		12
Austin, C. H., & J. Hutton	Cabot	29	5
Bailey, L. J.	Williamstown	12	6
Balch, H. A.	Hardwick	4	6
Bancroft, Dr. E. H., Sunnyside Farm	Barre	8	2
Bancroft, F. C.	do		22
Barber, Arthur C.	Plainfield	4	35
Bates, G. H.	Newport Center		15
Beard, R. E., & Co.	Orange	2	5
Beck, R. E.	Royalton		24
Bedor, George	St. Johnsbury	24	
Bemis, C. A.	Williamstown		12
Billings, B. A.	Rochester		18
Billings, Chester R.	do		10
Bingham, Roy	Middlebury	2	9
Bjorn, J. C.	Randolph Center		11

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Bousquet, A.	Lowell.		23
Boutin, John.	Lake.		22
Boynton, L. D.	Morrisville.		14
Bramen, Frank.	Washington.		16
Briggs, Merton E.	Barre.		18
Briggs, William P.	Williamstown.	13	1
Bump, W. F.	Salisbury.		13
Burditt, George E.	Rochester.		15
Burnham, Elmer.	Marshfield.		19
Cano, M.	Barre.		11
Carl, Theo.	Lowell.		16
Carson, Fred J.	Danville.	4	18
Cass, William H.	do.		10
Clark, A. G.	Union Village.		28
Clark, Mrs. Kate, Home Farm.	West Milton.		26
Clark, T. C. (Mary Clarke state).	Williston.		20
Clark, Wright.	do.	97	
Cline, F. G.	South Newbury.	2	23
Colby, E. J.	Plainfield.		17
Conant, Vance.	Vershire.		10
Conrad, L. M.	Hardwick.		19
Corbin, C. S.	Cornwall.		17
Corliss, G. M.	East Swanton.		29
Cummings, George I.	Montpelier.	15	12
Cumming, J. A.	Barre.		22
Currier, W. S.	Island Pond.		18
Curtis, E. A.	St. Albans.	4	56
Curtis, Victor.	Washington.		18
Cushman, E. B.	New Haven.		19
Cutler, Carleton.	Springfield.		11
Davis, Charles S.	Norton Mills.		26
Dillon, Edward A.	Bristol.		45
Drennan, R. F.	Woodbury Center.		27
Duffy, Walter F.	Windsor.	39	
Dupuis, George.	Washington.		23
Dwinell, H. A.	Marshfield.	4	14
Elliot, Lee.	Island Pond.		20
Emerson, C. W.	Barre.		10
Emerson, F. B.	Orange.		18
Fisher, D. L.	Randolph.		20
Flynn, L. M.	West Topsham.	3	6
Forbes, Catherine A.	St. Johnsbury.	2	18
Gardner, C. W.	Newport.		39
Gifford, Charles E.	Bethel.		23
Gilbert, Lewis D.	Morrisville.	2	25
Gilman, G. A.	Orleans.		14
Gove, Elmer E.	Burlington.	6	7
Gray, L. M.	Plainfield.	17	11
Greene, James E.	Waterbury.	13	42
Hallock, W. P.	Vergennes.	21	3
Hardy, F. M.	North Troy.	6	
Harte, M. D.	Vergennes.		22
Holmes, F. E.	Randolph Center.		19
House, L. W.	Bloomfield.		12
Howard, F. W.	Randolph.		17
Howe, James.	Barre.		14
Hutchins, George.	East Barre.		14
Hyland, M. W.	Williamstown.		19
Jennings, W. B.	East Wallingford.		56
Johnson, Andrew.	East Montpelier.	21	21
Johnson, A. F., & Son.	Bradford.		41
Joslyn, W. C.	Waitsfield.	27	
Kittredge, H. Z.	Danville.	13	7
LaBelle, W. J.	White River Junction.	5	8
LaFlower, Napoleon.	Williamstown.		13
Lamoray, E. G.	West Glover.	19	
Leavitt, L. D.	Greensboro Bend.		26
Leonard, L. E.	Pittsford.		22
Leonard, Willard.	Glover.	14	
Letter, Eugene.	Barre.	21	21
Libby, F. A.	Chelsea.		16
Linton, G. C.	Randolph Center.		23
Macauley, D. F.	Shoreham.	39	1
Marsceill, Edgar.	Bristol.	32	43
Martin, W. E.	Norwich.	6	15
Martyn, Murray.	Plainfield.	18	33
Martin, R. J.	Rochester.	10	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
May, Fred H.	Thetford	16	4
Mayhew, George	Salisbury		14
McLean, M. J.	Williamstown		43
McKenzie, Allen	do.		16
Merrill, H. J., & Son, Home Farm	Williston	26	6
Montgomery, Arthur M.	Bethel		15
Moore, Charles A.	Worcester		19
Morgan, Herbert	Salisbury		25
Morrison, W. C.	Plainfield		16
Neff, Fred H.	Pittsfield		19
Newell, G. J.	Plainfield	5	21
Northrop, M. E.	Marshfield		21
Noyes, G. W.	Salisbury		16
Olmstead, H. R.	Franklin		25
Ordway, York	Washington	4	14
Parmalee, D. B.	Bristol		19
Pelzer, Martin	Vergennes		28
Perkins, George, & Son	Hardwick	56	4
Perry, C. D., & Son	Plainfield	4	38
Phelps, A. W.	Barre	5	15
Phenix, G. E.	Newport Center		33
Phenix, S.	South Troy		50
Pierson, Carl	Barre		20
Piper, Arthur	Vergennes	6	12
Poor, O. P.	Williamstown		42
Powell, C. C.	Jeffersonville	8	14
Powers, E. J.	Franklin		19
Purdy, J. D.	Manchester Center		36
Randa, E. J.	South Royalton		15
Richardson, H. A.	Lowell		34
Richardson, H. S.	Westfield		42
Riddel, Charles	Williamstown		22
Robinson, W.	South Hero	24	2
Robinson, W. H.	Sharon		36
Rouhan, James	Barre	2	28
Rutherford, D. S.	Woodstock		15
Sanborn, L. F.	Barre	8	26
Sanders, P. G.	Graniteville		20
Sawin, E. D., & Son	Windsor		20
Scott, N. T.	Newport		15
Seaver, F. C.	Williamstown		24
Seaver, W. M.	do.		12
Shackett, E. T.	New Haven		11
Sicard, J.	Barton		41
Skinner, H. A.	Barre	1	22
Smalley, E. A.	Morrisville	2	1
Smith, A. T., & Son	Barre	42	9
Smith, H. E.	Williamstown		31
Smith, J. E.	White River Junction	14	10
Smith, W. H.	Barre	6	14
Spooner, B. C.	Randolph		11
Spooner, S. M.	Bethel		11
Sprague, James P.	East Brookfield	5	26
Stanciliffe, G. S.	Morrisville	6	35
Stevens, H. H.	Bloomfield		21
Stevenson, M. A.	Newport		15
St. Paul's Church, J. A. Harrington, trustee.	Vergennes		32
Strobridge, F. E.	Barnet		22
Swane, J. A.	Brookfield	3	24
Thomas, O. A.	Rutland	58	
Thorburn, Andrew	Norwich	2	21
Town, Dean P.	Plainfield	13	
Tripp, E. R.	Williamstown		27
Turner, William B.	Orange	4	6
Tuttle, G. M.	South Londonderry	66	
University of Vermont	Burlington	15	
Vermont Marble Co:			
Florence Farm	Proctor		67
M. H. Reynolds Farm	do.		73
Vermont Sanitarium	Pittsford		16
Waite, S. B.	Hyde Park		11
Ward, B. S., Flannagan Farm	Moretown	38	5
Washburn, A. B.	Brookfield		22
Wheeler, W. P.	Plainfield		14
Wheeler & Keeler	North Craftsbury	16	
White Bros.	West Topsham	17	

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Whitney, Ora.	Barre	2	14
Wilcox, Ralph C.	Randolph Center	3	31
Wiley, L. M.	Barton		12
Wilson, Henry E.	St. Johnsbury	20	
Wing, W. H.	Rochester		14
Woodman, W. S.	Vergennes		11
Woodward, C. L.	South Royalton	12	9
Young, F. L.	Randolph Center		12
VIRGINIA.			
Akers, P. D.	Rockymount	4	6
Andes, A. J.	Bealeton		11
Andes, S. K.	Remington	4	41
Anthony, W. P.	Harrisonburg		11
Ashby, W. W.	Remington		40
Atkinson, W. P.	Dumbarton		22
Baptist Orphanage	Salem		18
Barbour, J. S.	Fairfax		13
Beahm, G. W.	Midland		54
Beane Bros.	Catlett	7	17
Beck, C. Nelson	Charlottesville	2	5
Beck, X.	Richmond		19
Bishop, J. S.	Hampton, R. R.		17
Boteler, R. E.	Remington		19
Bowman, J.	Callaway	6	12
Bowman, L. A.	do.	6	19
Boyer, J. M.	Woodstock		27
Bready, Geo. R.	Herdon		27
Burkholder Bros.	Harrisonburg, R. 1.		13
Burner, C. W.	Waterlick		19
Bush, H. B., & Bro.	Michaux		46
Cameron, F. M.	McLean		13
Carter, F. Scott	Warrenton, R. 1.	1	64
Cassell, John	Calverton		18
Cheney Bros.	Randolph	1	44
Clark, C. F.	Culpeper	8	92
Clark, J. C.	Mount Jackson	4	13
Clarkson, J. A.	Brookewood	13	19
Clingenpeel, C. J.	Boone Mill	1	18
Coffman, J. A.	Bealeton		22
Comer, W. N.	Luray		12
Crabill, D. M.	Toms Brook	2	5
Crenshaw, H. J.	Charlottesville		18
Crenshaw, W. G.	Orange		45
Crowell, J. L.	Vienna		27
Cummings, J. S. D.	Hampton		32
Curles Neck Farm	Richmond	8	55
Davis, C. B.	Witt		17
Delp, Strawder	Fairfax		27
Diehl, W. L.	Nokesville		13
Drinker, Geo. R.	Richmond	1	13
Dunlop, Davis	Petersburg	27	1
Eakin, J. L.	Blacksburg		18
Edmonson, W. G.	McLean	1	23
Ferguson, L. C.	Herdon		18
Fitzwater, I. B.	Nokesville		21
Funkhouser, Arthur	Midland		12
Funkhouser, G. C.	Fairfax		15
Gaskins, W. T.	Catlett		12
Gentry, P. H.	Charlottesville	1	31
Glaetthi, Carl	Catlett		41
Gold, J. C.	Winchester		15
Golladay, Ernest	Woodstock		11
Golladay, W. L.	do.	2	8
Good, D. A.	Remington		12
Green, John S.	Manassas		28
Griffith, J. T., jr.	Hamilton		12
Groves, O. A.	Remington		10
Gwin, C. A.	Alexandria		16
Hale & Fogle	Nokesville		12
Hall, H. T.	Roanoke		29
Hannah, F. R.	Fincastle		27
Harpine, J. W.	Mount Jackson	2	7
Harrison, H. B.	Purcellville		17
Hepner, S. B.	Woodstock	5	12
Hiner, Geo. D.	Manassas		11

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VIRGINIA—continued.			
Hoddinott, W.	Charlottesville		12
Hoffman, J. W.	Middleburg		38
Holland, Edward	Eastville		18
Hollins College	Hollins	52	7
Hoover, W. C.	Timberville		32
Howard, W. L.	Manassas		14
Huff, P. C.	Roanoke		103
Isenberg, Mrs. F. C.	Catlett		43
Ivy, W. S.	Petersburg, R. 3	5	12
Jacobs, C. L.	Manassas		20
Janney, C. P.	Ashburn		37
Jeffress, T. F.	Drewrys Bluff	1	13
Johnson, C. O.	Herndon		19
Jones, B. W.	Dry Fork		41
Kesler, P. W.	Roanoke		19
Kimberly, J. B.	Fort Monroe		14
Kirkpatrick, Webster	Ashburn		15
Lary, S. P.	Norge	4	20
Laughlin, Clifton	McLean	5	13
Leigh, H. V.	Vienna		12
Lewis, F. A.	Manassas		19
Lohr, A. B.	Vienna	2	37
Lunsford, J. M.	Meetze Station		16
Lynn, Mrs. Roberta	Bristow		22
McClanahan, C. G.	Vienna		15
McComb, F. W.	Bluemont	3	49
McConchie, J. W.	Bealeton		23
Mack, Albert	McLean	1	10
Manassas Industrial School	Manassas	13	2
Marshall, R.	Williamsburg		16
Martin, R. C.	Bealeton		26
Martin, W. G., & Son	Remington	4	33
Mason, S. M.	Gainesville		25
Mateer, R. E.	Hunter		16
Middleton, M. H.	Herndon		17
Miller, J. C.	Sperryville	11	52
Miller, J. P. F.	Bealeton	7	24
Miller, W. O.	Manassas		12
Millman, J. M.	Bealeton		39
Mohler, F. N.	Herndon	15	20
Morris, Jas. S.	Charlottesville	2	20
Myers, H. F.	Clifton Station		51
Naff, J. A.	Boone Mill	2	23
Neff, E. E.	Fairfax		21
Nichols, A.	Remington		16
Nuckols, O. N.	Rio Vista	3	37
Oliver, H. L.	Vienna		17
Ott, F. C.	Remington		25
Owen & Owen (Inc.)	Denniston	1	19
Parker, D. W.	Burkeville		27
Parrish, J. Scott	Drewrys Bluff	17	71
Patillo, Z. C.	Dumbarton	1	34
Payne, J. I.	Nokesville		24
Payne, R. B.	Round Hill		13
Peck & Bayne	Fincaisle		28
Perrow, W. B.	Remington		16
Piercy, J. M.	Gainesville	3	24
Pitzer, A. N.	Roanoke		32
Porterfield, T. G.	Mountain Lake		27
Pratt, L. W.	Farmville	40	
Printz, R. C.	Ashburn	6	10
Radford Creamery	Radford	5	37
Ratcliffe, John R.	Richmond	5	4
Rawlings, A. A.	Rectortown	6	11
Reeves, Geo. R.	Ballston		36
Rhodes, F. H.	Calverton	1	14
Riffe, H. H.	Elliston	8	11
Rodgers, C. C.	Herndon		23
Rogers, H. C.	Hamilton		19
Rogers & Rogers	Herndon		14
Rosenkrans, E. E.	Sawedge	12	2
Ross, G. W.	Stuart	8	22
Ruffin, Jas. McI.	Petersburg	23	
Russell Bros.	Clearbrook		34
Russell, J. W.	Warrenton	3	6
Sager, G. R.	Woodstock		11

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VIRGINIA—continued.			
Schmidt, E. G.	Richmond	27	
Shackelford, J. H.	Elkwood		30
Shaner, Jos. S.	Natural Bridge	4	4
Sharitz, T. J. B.	Wytheville		10
Sinclair, J. C.	Hampton		13
Slaughter, D. A.	Mitchells	5	51
Slauson, E. M.	Williamsburg		21
Slusher, E. A.	Manassas		10
Smith, G. L.	Morrison	24	24
Smith, O. E.	Harmony Village		26
Smith, W. M.	Remington		18
Spitler, W. V.	Nokesville		11
Spitzer, J. E.	Midland		20
Stickley, P. B.	Stephens City		49
Sullins College	Bristol	12	22
Sullivan, Sam, & Son	Brandy Station	30	
Suthard, C. P.	Catlett		17
Thomas, S. G.	Grant		15
Tillett, T. R.	Ashburn	2	78
Troutt, Dr. Hugh	Roanoke	19	13
Turner, Mark	Vienna	8	24
Twiford, Jas., jr.	Norfolk		11
Vaux, Mrs. E. M.	McLean	1	4
Vinyard, W. H.	Vinton		33
Virginia Normal & Industrial School	Petersburg		16
Walker, J. F.	Woodstock	4	6
Walters, J. M.	McLean		29
Warren, M. C., & Son	Hot Springs		38
Watkins, G. D.	Fairfax		23
West, J. W., & Son	Hampton, R. I.		22
Western State Hospital	Staunton		64
Whaley, C. O.	McLean		16
Wheeler, N. A.	Wellington		17
Whitehead, R. D.	Chatham		45
Whitesel, D. Roy	Harrisonburg	2	9
Williams, E. D.	East Falls Church	8	
Williams, O. L.	Round Hill		29
Wine, J. D.	Forestville		10
Wingfield, J. R.	Charlottesville	2	34
Wittig, I. N.	Gainesville		23
Wood, W. G.	Roanoke		18
Woodfin, S. B.	Ashland		19
Woods, Mrs. Susan A.	Sterling	1	16
Yeatts, Benjamin	Dry Fork		11
WASHINGTON.			
Allen, J. T.	Palouse		17
Barclay, C. H.	Pullman	31	
Bekins, Daniel	Bothell	33	
Bell, T. C.	Colville	9	4
Buck & Hoem	Snohomish	22	19
Burlingame, F. O.	Chehalis		16
Busch, Ernest	Cheney		24
Christanson, R. R.	Everett		13
Compton, J. T., & Son	Wenatchee	11	
Dean, E. P.	Walla Walla	7	
Dickson, Ernest A.	Colbert		15
Eldridge, Charles	Chinacum	44	14
Fowler, H. E.	East Sound		12
Frame, Price	Ceres	11	12
Franz, John	Cheney		12
Gabby, Charles E.	Pullman	5	12
Galvin, George J.	Centralia	5	
Gass, M. C.	Bluecreek		19
Graham, C.	Ferndale	38	
Gross, William E.	Walla Walla	30	
Hamilton, A. O.	Satsop	32	
Hamilton, Dennis	Chehalis	13	
Hamilton, Frank	do.	7	
Hamilton, Harry	Forest	29	
Hansen, H. C.	Chehalis		13
Harrison, W. H.	Sunnyside		13
Hollywood Farm	Hollywood	151	33
Horan, Mike, & Sons	Wenatchee	37	
Hunsley, G. H.	Hillyard	5	
Ide, G. B.	Colville	5	

Tuberculosis Eradication under the Accredited-Herd Plan. 55

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WASHINGTON—continued.			
Jones, David.....	Dabob.....	14	.....
Kelly, D. J., & T. Williams.....	Sunnyside.....	.....	46
Kempendonk, C. H.....	Chimacum.....	8	.....
Lee Bros.....	Mount Vernon.....	14	5
Lee, C. J.....	Onalaska.....	12	.....
McCormick, John.....	Ferndale.....	6	4
McKinney, E. S.....	Walla Walla.....	.....	14
Meeker, R. D.....	Deer Park.....	.....	11
Moses, E. M. & A. M.....	Chehalis.....	8	.....
Nelson, R. S. & M. G.....	Espanola.....	9	25
Porter, J. D.....	Spokane.....	13	.....
Pratt, C. E., jr.....	Port Orchard.....	5	.....
Rayton, L. F.....	Chehalis.....	9	10
Rector, Jess & Laura.....	Tono.....	11	13
Rector, W. I.....	do.....	9	19
Roundtree, G. O.....	Klaber.....	9	.....
Scribner, J. W.....	Chattaroy.....	.....	14
Shoultes, H. R.....	Adna.....	23	46
Todd, William, & Son.....	North Yakima.....	47	.....
Tulalip Indian School.....	Tulalip.....	.....	25
Tyson & McKelheer.....	North Yakima.....	37	.....
Van Belle, C. G.....	Sunnyside.....	6	.....
Washington State College.....	Pullman.....	24	.....
White, W. R.....	Sunnyside.....	11	.....
Young, Fred.....	Chehalis.....	.....	15
WEST VIRGINIA.			
Ball, S. S.....	Ravenswood.....	9	25
Becken, Theodore.....	Wheeling, R. R.....	.....	14
Becker, Daniel.....	Wheeling, R. 2.....	.....	16
Caldwell, Dr. J. R.....	Wheeling.....	10	.....
Caldwell, James.....	Short Creek.....	9	.....
Cavalier & Son, C. J.....	Harpers Ferry.....	7	2
Church, Charles W.....	Morgantown, R. R.....	1	11
Creamer, John P.....	Kearneysville.....	.....	19
Crow, Charles L.....	Elm Grove.....	3	7
Cummings, L. O.....	Charleston.....	.....	16
Curry, J. F.....	Fort Springs.....	.....	40
Curtis, Salathiel.....	West Alexander, Pa.....	.....	12
Davis, S. Erlow.....	Janelew.....	7	22
Dunkle, E. P.....	Huntington, R. R.....	.....	22
Everett, J. A.....	Ona.....	.....	19
Fischer, Louis.....	Triadelphia.....	.....	45
Hill, Mrs. Wm.....	Bethany.....	16	20
Hugh, Samuel D.....	Wheeling, R. 2.....	.....	10
Hunt, Edward.....	West Alexander, Pa., R. R.....	3	10
Kanawha Hotel Co.....	Charleston.....	1	54
Linton, Mrs. C. A.....	Triadelphia.....	.....	16
Livesay, E. E.....	Lewisburg.....	3	36
Marple, G. E.....	Wheeling, R. 3.....	.....	12
Miller, Earl.....	West Liberty.....	.....	10
Miller, Edward.....	Wheeling, Edgington Lane.....	2	9
Mooney, C. L.....	Charleston, R. 2.....	.....	14
Mount DeChantel Academy.....	Wheeling.....	4	17
North, B. S.....	Wheeling, R. 1.....	5	18
Ohio County Farm.....	Wheeling.....	1	37
Schmidt, N. J.....	Wheeling, R. 2.....	.....	16
Schmetz, Joe A.....	Elm Grove.....	29	.....
Seiber, John A.....	Triadelphia.....	.....	12
Stone, W. E.....	Wheeling R. R.....	12	16
Tuckviller & Livesay.....	White Sulphur Springs.....	28	17
Vorholt, Bros.....	Charleston, R. R.....	.....	10
Wagley, H. W.....	Kearneysville.....	.....	24
Ward, Ernest.....	Huntington, R. 1.....	.....	18
Ware, J. W.....	Shepherdstown.....	2	16
Wells, R. M.....	Woods.....	3	28
Williams and Worefel.....	Huntington, box 96.....	9	26
WISCONSIN.			
Alberts, Edwin F.....	Watertown.....	10	3
Alexander, Phil.....	Barron.....	.....	28
Alexander, Wm.....	Ableman.....	2	17
Allen, Harry.....	Winniconne.....	.....	24
Allen, Harry O.....	Allenville.....	11	31
Anderson, H. E.....	Cumberland.....	9	.....

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Andrus, M. P., & Sons.....	Plymouth.....	28	1
Anson-Eldred Co.....	Stiles.....	7	51
Amunson, Henry.....	Allenville.....		19
Ascott, Mrs. W. H.....	Sparta.....	26	
Austin-Blaine Farm Co.....	Boscobel.....	34	
Barber, George.....	Winneconne.....		20
Bauer, Frank, & Sons.....	Weyauwega.....	5	22
Baumgartner, W. C.....	Monticello.....	25	
Becker, M. P.....	Hartford.....	22	
Beers, Ray.....	Lake Beulah.....	16	
Behreandt, Henry.....	Athens.....		17
Berg, C. O.....	Stoughton.....	12	18
Bergin, John J.....	Watertown.....	31	16
Berner, A. O.....	Larsen.....	2	
Bethel Academy.....	Bethel.....	2	13
Bentow, Levi.....	Cadott.....		24
Bolger, John C.....	Waterloo.....		19
Boss, Ulrich C.....	Oshkosh.....	13	7
Bowers, T. C.....	Waupaca.....	10	22
Brace, H. A.....	Lone Rock.....		17
Bratberg, Ansel.....	Holmen.....	52	3
Bratberg, O. N.....	do.....	2	21
Braun, Geo.....	Greenwood.....		22
Brickbauer, Carl.....	Elkhart Lake.....	2	20
Brickbauer, J. J.....	do.....	18	1
Brill, John P., jr.....	do.....	15	4
Brobst, Frank.....	Sheboygan.....	24	
Brown, S. A., & Son.....	Mondovi.....	9	29
Bruggink, Ed.....	Hubbleton.....	6	29
Buchanan, T. Y.....	Oostburg.....	4	22
Buekholtz, Herman & Son.....	New Auburn.....	6	30
Buehring, Herman.....	Manawa.....	6	25
Buelke, Geo. W.....	Oshkosh.....		30
Buelke, Paul.....	Plymouth.....	16	
Buetow, Levi.....	Waldo.....	6	9
Buettner, Arthur.....	Cadott.....		19
Bussewitz, W. E.....	Bay City.....		35
Buttles, E. C.....	Juneau.....	33	
Calder, Archie.....	Lake Beulah.....	22	
Calkins, W. E.....	Allenville.....	25	
Chaplin, E. W.:.....	Winnicenne.....	32	
Farm No. 1.....	Waldo.....	16	3
Farm No. 2.....	do.....	6	12
Christianson, Clarence.....	Allenville.....		14
Christianson, Elmer.....	Larsen.....	3	23
Christianson, Julius O.....	do.....	5	21
Christianson, W. R.....	Hortonville.....		15
Chrouser, James L., & Bro.....	Stratford.....	32	2
Claflin Bros.....	Mondovi.....		11
Cody, John F.....	New Richmond.....	12	16
Collins Bros.....	Kendall.....	2	21
Comings, W. S.....	Eau Claire.....	37	19
Connelly, Edd.....	Luck.....	11	2
Cornelius, Chas.....	Larsen.....		24
Cummings, J. O.....	Neenah.....		23
Danielson, G. D.....	Scandinavia.....		17
Davies, Dallas E.....	Elkhorn.....	13	20
Denfield, Arthur.....	Wausau.....		17
De Preston, Ed.....	Ellsworth.....	18	
Dettmann, Henry.....	Adell.....	5	26
Dickinson, Nathan, & Son.....	Lake Geneva.....	54	2
Diener, Frank.....	Random Lake.....	4	13
Diercks, Henry.....	Bryant.....	4	12
Eagan, Jos.....	Winnicenne.....		14
Earl, H. H.....	Eagle.....		26
Eastman, S. A.....	Plymouth.....	20	1
Ells, G. W., & Ross H.....	Delavan.....	12	
Engebretson, Elmer G.....	Gratiot.....	33	
Erdman, A. F.....	Neenah.....		15
Erickson, Sam.....	Sheridan.....	5	20
Ewings, Everett C.....	Jim Falls.....		15
Falk, A. F.....	Auburndale.....		35
Friebel, Ed.....	Deerbrook.....	3	24
Funk, E. F.....	Jamesville.....	19	29
Gadson, E. Clark.....	Marshfield.....	2	10
Gadson, John E.....	do.....	16	3
Garrity, John.....	Manawa.....		24

Tuberculosis Eradication under the Accredited-Herd Plan. 57

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Garside, Harry.....	Oostburg.....	21	1
Geraldson, Morton.....	Manitowoc.....	24	
Gibson, O. E.....	Eau Claire.....	15	11
Giese, John.....	Loganville.....		42
Gilbert, Wm.....	Elkhorn.....	17	
Gleiter, G. G.....	Barron.....	4	25
Goelzer, Conrad.....	Plymouth.....	28	
Goelzer, Roland.....	do.....	27	
Goetz, W. F.....	Stratford.....	12	9
Gormley, J. E., Farm No. 2.....	Delavan.....	18	
Gramling Bros.....	Dousman.....	24	
Green, H. W.....	Antigo.....	3	20
Greenwood, C. F.....	Lake Mills.....	5	6
Grenlie, O. H.....	Scandinavia.....	20	3
Gresch, Fred.....	Antigo.....	10	27
Griesbach, Jacob.....	Greenville.....		26
Gronert, Arnold.....	Watertown.....	11	
Grove, Albert.....	Columbus.....	25	
Grove, Christian.....	do.....	41	
Guenther, Adam.....	Antigo.....	2	18
Gustavson, Norman W.....	Manitowoc.....	6	7
Gutschenritter, A. J.....	Hartford.....	5	6
Habeck, Louis.....	Random Lake.....	5	15
Haese, Julius.....	Winneconne.....		19
Haggerty, Jerry.....	Waldo.....	21	1
Haire, E. E.....	Weyauwega.....		15
Hallett, Harvey.....	Appleton.....	6	
Haney, O. A.....	Lone Rock.....	2	23
Hansen, Chas. A.....	Waupaca.....	4	10
Hanson, Soren.....	Larsen.....		21
Harder, John H.....	Plymouth.....	20	8
Hart, D. A.....	Neenah.....		25
Haseleu, M. T.....	Waterloo, Gilt Edge Farm.....	28	
Hawes, L. F.....	Pewaukee.....		15
Hayward Indian School.....	Hayward.....	5	40
Heagle, Ed.....	Cadott.....	15	11
Hebert, D. E.....	Unity.....		17
Heil, F.....	Wausau.....	13	2
Heinzelman, M. H.....	Ripon.....	2	12
Held, Frank.....	Adell.....	11	12
Herman, Emil.....	Edgar.....	2	15
Hesselberg, A. E.....	Rockland.....		18
Hesselberg, J. L.....	do.....		17
Hesselberg, Walter.....	Bangor.....	7	13
Hoesly, A. C.....	New Glarus.....	21	30
Hoesly, Anton H.....	Eau Claire.....	14	3
Hoesly, Baltz: Farm No. 1.....	New Glarus.....	39	7
Hoesly, Gilbert P.....	do.....	9	
Hoffman, R. W.....	do.....	36	
Holbrook, Chas.....	Winniconne.....		20
Horlamus, J., & Son.....	Plymouth.....	7	2
Hoverson, Theo.....	West Bend.....	27	
Howard, M. C.....	Barron.....	7	10
Howard, J. W.....	Cameron.....	2	22
Hruska, Ed. W.....	Genneseo.....	30	3
Hudson, J. L.....	Antigo.....	6	12
Huenink & Lubach.....	Lavalle.....	14	19
Huffcut, J. H.....	Cedar Grove.....	13	9
Hyde, S. Y.....	Ogdensburg.....	16	
Indermuehle, Henry.....	La Crosse.....	37	
Jenks, Calvin.....	Hartford.....	2	22
Jensen, J. P.....	Holmen.....	3	25
Jochimsen, Edwin J.....	Scandinavia.....		13
Jochimsen, Rudolph.....	New Holstein.....	4	30
Johnson, K. N.....	do.....	9	17
Johnson, Sam L.....	Larsen.....		17
Johnston, Frank R.....	do.....		11
Jones, S. B., & Son.....	Watertown.....	31	
Jorgenson, Loyal.....	do.....	27	8
Kahler, Herman.....	Larsen.....		18
Kalmerton, Floyd.....	Hillsboro.....	9	12
Keller, H. R.....	Sheboygan Falls.....	3	14
Kelly, J. H.....	Stratford.....	2	16
Keshena Indian School.....	Chippewa Falls.....	15	35
	Shawano.....		44

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Kleinhesslink, John J.	Oostburg.	3	14
Kloehn, John F.	Forest Junction.	21	6
Knecht, Andrew.	Cochrane.	34	1
Knick, Gus.	Hillsboro.	17	
Knoke, O. F.	Birnamwood.	4	26
Koch, Wm.	Lone Rock.	31	4
Konecny, Jos. F.	Dorchester.	10	12
Konrad & Japp.	Larsen.		24
Kruschke, A. C.	New Richmond.	13	18
Kruschke, Harold.	do.	12	6
Kruse, Conrad.	Loganville.	18	5
Kukuk, Geo.	Randolph.		12
Kunz, R. F.	Eland.		16
Kyes, S. M.	Owen.	19	
Lane, Otis W.	Bloomer.	4	26
Larsen, Theo.	Larsen.	3	12
Lasch, Geo.	Lyons.	7	4
Laux, John J.	Random Lake.	12	4
Lebies, Otto.	Bloomer.		13
Lebies, T. J.	do.	3	25
Lehmann, F. G.	Watertown.	23	
Lehmann, Wm. J.	do.	10	
Lenz, W. G.	Stratford.	24	3
Lepien, Raymond D.	Hartford.	23	5
Liebenstein, Geo.	Adell.	13	5
Liebenstein, Harvey G.	Cascade.	5	
Liebenstein, P. J.	Adell.	10	
Lindow, Harry E.	Manawa.	4	34
Lohnis, Wm.	Oostburg.	5	7
Loper, L. R.	Rosendale.		13
Lorentzen, Viggo.	Withee.	15	
Luebke, H. W.	Watertown.	42	
Luedtke, C. F.	Neenah.		19
Lutteman, W. H.	Loganville.	3	18
McCloy, Geo. H.	Ogdensburg.		11
McCraig, Mrs. Jas., & Son.	Watertown.	3	18
McFarland, Paul.	do.	17	6
McFarland, Ray.	do.	21	6
McKinney, E.	Barron.	4	19
McKone, James.	Green Bay.	17	
McMillan, B. F., & Bro.	Marshfield.	23	15
Malloy, P. J.	Manawa.	8	17
Manley, Thos. F.	Columbus.	7	12
Manning, T. J.	Hartford.	9	8
Marty, Jacob M.	New Glarus.	39	19
Mathieu, Theo.	Chippewa Falls.	20	44
Maxwell, A. R.	Allenville.	5	16
Meadows, Fred G.	Lyons.	9	3
Messerschmidt, Louis.	Hartland.	22	7
Metzig, W. F.	Neenah.	4	10
Michaels, W.	Berlin.	13	
Milbrant Bros.:			
Farm No. 1.	Evansville.	15	9
Farm No. 2.	do.	33	
Miley, Jos. L.	Sheboygan Falls.	9	4
Miller, Arthur G.	Oconomowoc.		18
Miller, Franklin.	Adell.	12	4
Miller, Fred C.	West Salem.	20	15
Miller, John.	Winnicoone.		17
Minahan, Dr. John R.	Green Bay.	16	
Miner, E. E.	Marshfield.	3	18
Minshall, Geo.	Elkhorn.	30	
Mueller, Edward O.	Appleton.	15	
Mullen, Frank R.	Watertown.	32	3
Mullen, Math.	Bloomer.	3	50
Mullen, Owen E.	Watertown.	23	
Murphy, Lawrence F.	Hartford.	26	
Murray, Geo. C., & Sons.	Manawa, Farm No. 2.	16	1
Murray, John.	Ogdensburg.	7	4
Nelson, Erwin.	Blue River.		19
Nelson, P. H.	Whitewater.	10	6
New Holstein Canning Co.	New Holstein.	13	11
Nicolai, C. J.	New London.	19	3
Nieman, R. W., & Sons.	Appleton.	11	13
Northern Hospital.	Winnebago.	13	9
Nueske, W. H.	Iola.	6	6

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Nuttleman, Alfred.....	West Salem.....	28	6
Nuttleman, Arthur.....	Holman.....	21	3
Oberson, Ole.....	Westby.....	2	30
Oldeen, C. A., & Son.....	Cumberland.....	30	
Oleson, Jas.....	Kendall.....		29
Pabst, Gustave:			
Hollyhock Farm No. 3.....	Dousman.....	14	11
Hollyhock Farm No. 4.....	do.....	21	
Palmbach, Geo. A.....	Appleton.....		13
Paltzer, Nick.....	do.....	14	
Paulsen, Rudolph J.....	New Holstein.....		20
Peck, Howard.....	Elkhorn.....	40	
Peterson, O. F.....	Scandinavia.....	10	11
Pfingsten, John.....	New Holstein.....	10	
Pierce Bros.....	Monticello.....	46	
Pilgrim, Fred.....	Osceola.....	26	
Pilgrim, Herman.....	Edgar.....	6	14
Pinehurst Farms Co.....	Sheboygan Falls.....	123	
Pinkerton, John, jr.....	Waupaca.....	5	3
Pitzke, Chas.....	Stetsonville.....	45	5
Plamann, Fred.....	Appleton.....	27	
Plamann, Robt.....	do.....	12	5
Plummer, A. P.....	Oshkosh.....	3	20
Pollard, A.....	Elkhorn.....	11	6
Prindle, M. E.....	Neenah.....		21
Prueher, J. G.....	Bloomer.....		25
Quackenbush, W. W.....	West Salem.....	24	1
Rasmussen, Hans P.....	Larsen.....		14
Ray, R. L.....	Fau Claire.....	8	11
Reddelein, H. E.....	Oconomowoc.....	32	
Reed, Jas. J.....	Blue River.....		18
Reid, Jas. J., & Son.....	Oconomowoc.....	49	
Reinks, John.....	Sparta.....	14	
Reinks, M.....	do.....	14	3
Rheingans, E. C.....	Chippewa Falls.....	3	12
Rice, Jesse C.....	Ogdensburg.....	6	8
Rich, L.....	do.....		13
Rich, Roy.....	do.....	4	20
Riordan Bros.....	Plymouth.....	30	
Ritchie, Arthur W.....	Royalton.....	15	4
Ritchie, R. J., & Sons.....	do.....		25
Roberg, Aug.....	Cumberland.....	26	
Robers, Lawrence.....	Lyons.....	23	1
Roberts, Louis.....	Jim Falls.....		19
Roberts, R. F.....	Randolph.....	14	31
Rock, J. M.....	Plymouth.....	40	
Rock County Asylum.....	Janesville.....	8	56
Rohan, John B.....	New London.....	4	30
Rohda, Albert.....	East Troy.....	6	36
Ross, Lester A.....	Oshkosh.....	4	14
Ross, R. J.....	do.....	4	10
Ross, Robert.....	do.....	6	6
Rowe, A. L., & Son.....	Waupaca.....	31	
Royce, E. E.....	Marshfield.....	32	1
Roycroft, J. J.....	Cadott.....	9	7
Ruetten, Theo.....	Sparta.....	10	13
Riipple, J. H.....	Medina.....	7	8
Ruste, Olin.....	Parneveld.....	29	
Salm, Peter.....	Neenah.....	20	7
Sauter, John.....	Random Lake.....	16	8
Schaller, F. J.....	Holmen.....	2	17
Schaller, Geo. F.....	do.....	4	23
Schoelkopf, Albert.....	Bear Creek.....		14
Schroechert, Herman.....	Watertown.....	7	9
Schroeder, Chris.....	Neenah.....	9	8
Schroeder, C. F., & Sons.....	Marshfield.....	15	7
Schuette, C. W.....	Stratford.....	6	7
Schultz, Louis.....	Athens.....		23
Schwartz, Carl J.....	Elkhart Lake.....	5	2
Scrtsmeier, Fred A. R.....	Bloomer.....		36
Sebion, Tennis.....	Westby.....	7	6
Sedgwick, E. C.....	Limeridge.....		18
Selbach, F. H.....	Sparta.....	5	22
Sherbert, W.....	Weyauwega.....	3	14
Sieger, Jos. M.....	Avoca.....		27
Sipple, John S.....	Menomonie.....	6	14

HOLSTEIN-FRIESIAN—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Shore, W. E.	Blue River.		11
Skaftø, Albert.	Larsen.		15
Smith, C. J., & Co.	Monroe.	16	19
Smith, Roscoe.	do.	35	5
Sommer, Martin.	Appleton.		15
Sorges, Walter.	Reedsburg.	30	
Sparta State School.	Sparta.	7	21
Spencer, Arthur.	Evansville.	27	2
Spring Brook Farm Co.	Burnett.	54	1
Stecker, Lewis.	Appleton.	2	9
Steuerwald, Emil.	Adell, Farms Nos. 1 and 2.	10	12
Stevens, M. B.	Jefferson.	29	
Stigler, John.	Waukesha.	5	27
Stillman & Hamilton.	do.	6	11
Streiff, Emanuel.	New Glarus.	63	
Strickert, Henry.	Limeridge.		13
Sturges, W. A.	Neenah.		10
Swatscheno, Wm.	do.		24
Swan, E. E.	Wauwatosa.	30	
Swenberg, Robt.	Arpin.		26
Swenson, H. O.	Larsen.		10
Swift, Will V.	Eau Claire.		22
Swinehart, S. W.	Avoca.	12	26
Swoboda Bros.	Elkhorn.	26	9
Taege, John.	Appleton.	11	11
Taylor & Northey.	Whitewater.	11	19
Tellock, Frank.	Hortonville.		15
Tews Bros.	Neenah.	2	32
Thompson, Elmer.	Quarry.	11	3
Timm, Albert D.	De Forest.	17	3
Toepfer & Krey Stock Farm.	Madison.	42	1
Tracy, Duane.	Union Center.	7	7
Trumpy, Fred, & Son.	Clarno.	64	
Tuffley, C. E., & Son.	Boscobel.	11	6
University of Wisconsin, dairy herd.	Madison.	17	1
Uvaas, Orrin.	Larsen.	4	16
Vanderhof, D. E.	Waldo.	18	
Vander Schaaf, Chas.	Sparta.	17	
Vernon County Farm.	Viroqua.	21	10
Wachsmuth Bros.	Owen.	12	
Waeffer, Robt.	New Glarus.	8	42
Wagner, Mrs. J. M.	Union Center.	26	
Walsh, P. H.	Lavalle.	15	
Weaver, H. F.	Elkhorn.	21	
Weeks, Edwin.	Chilton.	7	28
Weihsart, A. W.	Watertown.	32	3
Wendt, Geo.	Appleton.	13	7
West Bend Canning Co.	West Bend.		23
Westphal, Frank.	Neenah.		11
Westphal, H. C.	Columbus.	5	30
Westphal, M., & Sons.	Elkhorn.	36	19
Weter, P. J.	Alden, Ill.	26	
Wieckert, Walter H.	Appleton.	17	18
Wightman, P. A.	Plymouth.	5	22
Wilke, Henry.	Wausau.		25
Wilson, Geo. A.	Granton.	9	
Winckler, B. F., & Son.	Medina.	19	
Winter, Lewis.	Antigo.	2	22
Wittig Bros.	Hartford.	38	
Woodard, O. C.	Weyauwega.		19
Wright, Smith H.	Cadott.	18	1
Wunderlich, Geo. H.	Elmhurst.		34
Zenzel, Albert.	Curtis.	17	
Zerbach, Geo.	Holcombe.	7	3
Ziegler, Emro C.	Appleton.	9	7
Ziegler, F. A.	do.	29	
WYOMING.			
Cornell, F. W.	Moorecraft.		17
Total (Holstein-Friesian, United States).		26,357	40,650

Tuberculosis Eradication under the Accredited-Herd Plan. 61

JERSEY.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
ALABAMA.			
Alabama Polytechnical Experiment Station.	Auburn.....	25	.....
Alabama Insane Hospital.....	Tuscaloosa.....		103
Alabama Masonic Home.....	Montgomery, box 475.....	1	22
Allen, B. M.....	Birmingham, R. 2.....	8	22
Anderson, E. B.....	Marion.....	2	39
Blake, J. H.....	Blocton, R. 2.....		26
Burge, Samuel.....	Montgomery, R. 2.....		24
Calloway, Lee.....	Snowdoun.....		37
Calloway, John B.....	Hope Hull.....		12
Canebrake Experiment Station.....	Uniontown.....	29	31
Christian, T. S.....	Alexander City.....		15
Davis, J. C.....	Oxford.....		37
Davis, W. W.....	Wilsonville.....		13
Edwards, M. H.....	Dothan.....		46
Ford, Chas.....	Gallion.....		56
Hall, M. R.....	James.....		16
Holt, E. W.....	Montgomery, R. 2.....		18
Houghton, M. B.....	Montgomery.....	4	17
Johnson, Mrs. W. M.....	do.....	2	25
Korkritz, H., jr.....	Wilsonville.....		50
Kirby, J. W.....	Marion Junction.....		24
Kirby, P. L.....	do.....		20
Kurlin, G. W.....	Alexander City.....	5	3
Martion Bros.....	Fort Deposit.....		11
Meadows, H. H.....	Lowndesboro.....		57
Miller, B. F.....	Montgomery.....		36
Mitchell, J. G.....	Opelika.....		67
Muliins, D. B.....	Dothan.....	3	49
McCurdy, George.....	Hayneville.....		75
McCurdy, W. D.....	Lowndesboro.....		92
McInnis, J. M.....	Montgomery.....		43
Oakley, J. G.....	Ashby.....		46
Ozment, C. E.....	Montgomery, R. 2.....		28
Parker, C. M.....	Opelika, R. 6.....		18
Porterfield, D. E.....	Fort Deposit.....		20
Streit, Sam.....	Leighton.....		71
Tyson, Mrs. S. A.....	Montgomery.....		34
Wadsworth, W. A.....	Prattville.....		87
Walker, T. R.....	Alexander City.....		13
Walton, J. C.....	Snowdoun.....		17
Watson, Mrs. Grace, & Son.....	Demopolis.....	4	12
Wilbanks, G. C. & J. W.....	Alexander City.....		24
Whatley, T. J.....	Opelika.....		38
White, Lawrence.....	Newbern.....	3	28
Williams, P. W.....	Ramer.....		34
Young, L. C.....	Montgomery.....		90
ARKANSAS.			
Trustee, A. H. Endowment.....	Jonesboro.....	47	.....
Beech Grove Jersey Farm.....	Helena.....	40	6
Buell, A. W.....	South Fort Smith.....	19	14
Bragg, Chas. A.....	Little Rock.....	12	7
Polk, C. L.....	Helena.....	28	76
Rutherford, M. M.....	Sulphur Rock.....	40	12
Stinson, E. Y.....	Benton.....	18	.....
University of Arkansas.....	Fayetteville.....	7	3
CONNECTICUT.			
Benton, A. H.....	Andover.....	5	4
Brown, E. E.....	Pomfret Center.....	20	.....
Camp, Wm. P.....	Durham.....	41	.....
Cheney, R. O., jr.....	South Manchester.....		10
Hallock, Bert C.....	Merrrow.....	9	5
Hatch, Royal B.....	Stafford.....	4	18
McClellan, Dr. Geo. E.....	Woodstock.....	1	15
Merrrow, Harriet L.....	Merrrow.....	4	18
Morgan, Dr. John.....	Hadlyme.....	8	3
Pitkin & Calhoun.....	South Manchester.....	35	7
Prescott Estate.....	Rockville.....	25	.....
Schofield, Seth.....	Stafford Springs.....	6	6
Schwartz, Philip.....	Suffield.....	11	.....
Smith & Tyler.....	West Willington.....	8	3
Storrs Agricultural College.....	Storrs.....	61	14

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
DELAWARE.			
Blue Ball Farm	Wilmington	20	
Cubbage, Clarence	Milford		13
Dill, Thomas E.	Felton		13
Matthews, W. C.	Wilmington	10	
Pearce, W. D.	Milford	10	
DISTRICT OF COLUMBIA.			
Kauffmann, Rudolph	Military Road, Washington	4	3
Scammel, R. E.	2610 Bladensburg Road, Washington		12
FLORIDA.			
Albano & Ferleto	Southern Feed Co., Ybor City		13
Alick, A.	Winter Park		15
Allison, J. S.	Live Oak		18
Amerson, J. D.	Pensacola, R. A., box 184		11
Anderson, Wm.	Tallahassee		14
Ard, H. A.	Pensacola		42
Ard, A.	Pensacola, R. A., box 272		50
Arpen, W. J.	South Jacksonville		35
Bailey, Jesse	Jacksonville		10
Bailey, R. E.	Shady Grove		35
Bailey, W. H.	Ebb		49
Jose Espina Balbin	Tampa, R. 1, box 24		75
Bembow, Oliver	Moore Haven		21
Betty, Miss Mae	Pensacola, R. A., box 310		17
Bety, L.	Pensacola		23
Bishop, Mrs. G. R.	Edgwood and Enterprise Avenues, Jacksonville		41
Bivins, T. W.	Jacksonville, R. 6, box 312		75
Black, T. D.	Dinsmore		41
Blitch, O. T.	Crange Park, post-office box 14	4	24
Boquardez, R. C., jr.	Tampa, R. 1		27
Bowman, John S.	Pensacola		12
Bradley, W. G.	South Tampa		22
Brainard, T. M.	Pensacola		16
Brasch, Wm. C.	Vero		15
Bray, Frank S.	Tampa, R. 4, box 94		39
Brinson, F. B.	Live Oak		16
Brooker, N. L.	Brandon		11
Broward, A. S.	Jacksonville, R. 2		12
Brown, John	Jacksonville		15
Brown, W. B.	Tallahassee		13
Brown, W. H.	Tampa, R. 5, box 138		25
Bruschke, Richard	Dinsmore		16
Buehler, Chas.	Orlando		10
Burnett, J. H.	Live Oak		13
Burney, E. J.	Jacksonville, R. 2, box 250		27
Camp, Jack	Ocala	21	26
Caro, Herbert P.	Pensacola		13
Carr, Thos. B.	Tallahassee		16
Carter, G. B.	Tampa, R. 1, box 80		23
Carter, W. L.	Dade City		20
Cavanaygh, J. J.	Tallahassee		25
Chairs, D. G.	do.		12
Chambers, C. E.	Gainesville, R. 4		38
Chrisborough, A. D.	Jacksonville		31
Cleveland, A. S.	Fort Pierce	1	87
Close, Mrs. Janie	Ocala		14
Cochran, Frank	Tallahassee		64
Collins, John	do.		33
Coniglio, V.	Oak Park, Tampa		18
Cope, W. H.	Jacksonville, R. 3		30
Cordray, J. P.	Jacksonville		10
Corporation of Florida	Sebring		11
Costakis, John	Dade City		13
Crabtree, J. O.	Jacksonville, R. 5, box 174		20
Craven, E. S.	Jacksonville, post-office box 88		26
Cromartie & Sons	Tallahassee		26
Crowder, Ralph S.	do.		15
Culver, J. W.	Orlando		30
Davidson, M. B.	3108 Florida Avenue, Tampa		15
Dean, Thos. L.	De Land		23
Dedman, W. R.	McIntosh	1	10
De Ring, Sidney	South Tampa		13
De Witt, Henry	Dade City		10
Dewy, Ernest	do.		22

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
FLORIDA—continued.			
DiSilvo, M.	Ybor City, care Southern Feed Co.		13
Douglass, Dr. J. W.	414½ Tampa Street, Tampa.		20
DuBois, H. F.	Tampa, box 1515.		25
Durst, Mrs. C.	Seminole Heights, Tampa.		11
Edge, A. E.	Jacksonville, box 801.		32
Edwards, D. G.	Gainesville, R. 4.		16
Ellis, C. W.	Jacksonville.		23
Ellis, Gillin.	Lackwanna Avenue, Jacksonville.		16
Export Railway Co.	508 Florida Avenue, Tampa.		10
Feaster, J. A.	Florida City.		11
Fisher, A. A.	520 Buffalo Avenue, Tampa.		52
Fisher, D. S.	Seminole Heights, Tampa.		61
Fisher, W. A.	Fifteenth Street and Twenty-eighth Avenue, Tampa.		29
Freiman Bros.	Brooksville.		14
Fridell & Mills.	Jacksonville, R. B, box 401.		49
Gainesville community herd.	Gainesville.		14
George, F. L.	Miami.		43
Giles, W. E.	Winter Park.		14
Glover, A. L.	Grand Crossing.		25
Gooding, Mrs. M. C.	603 Tampa Street, Tampa.		54
Goolsby, A. A.	Miami, box 269.		30
Graham, A. W.	Miami, R. B, box 264.		32
Graham, W. J.	Tallahassee.		30
Gray, H. W.	Jacksonville, R. 6, box 270.		43
Green, E. B.	Ocala.		14
Green, R. R.	Live Oak.		13
Grunoleo, Peter.	Fulford.		10
Haines City community herd.	Haines City.		15
Harbeson, W. B.	De Funiak Springs.		14
Hamilton, Harry E.	Tallahassee.		15
Hathaway, L. D.	Brooksville.	1	6
Heine, Mrs. R. B.	Pensacola.		26
Henkel, A. L.	Maitland, R. 2.		14
Herron, J. C.	West Tampa, R. 4, box 30.		32
Highsmith, J. A.	Gainesville, R. 2.		10
Hildebrand, V.	Grand Crossing.		29
Holding, J. M.	Dania.		23
Hooper, J. S.	Tampa, Arlington Hotel.		15
Hopper, E. H.	Jacksonville.		31
Houser, W. E.	Gainesville, R. 4.		11
Houtsma, Jacob.	Tampa, general delivery.		15
Hoyt, Geo. A.	Pensacola.		22
Hubbert, Harry.	Tampa, box 1142.		18
Hughes, T. B.	Gainesville, R. 2.		16
Hyer, Mrs. J. W.	Pensacola.		17
Jellesema, Jacob.	Tampa, general delivery.		15
Jernigan, F. P.	Pensacola.		10
Johns, A.	2698 Enterprise Avenue, Jacksonville.		15
Johnson, David.	Miami.		28
Johnson, Peter.	Roberts.		24
Johnson, R. G.	Tallahassee.		81
Johnson, W. E.	do.		16
Johnson, W. J.	Chaires.		10
Joiner, J. J.	Tallahassee.		16
Jordon, Samuel.	Jacksonville.		32
Kelly, J. N.	do.		29
Kennard, T. O.	Jacksonville, R. 3, box 266.		27
Killer, Clyde E.	Fort Pierce.		20
Kilman, S. J.	155 Riverside Avenue, Jacksonville.		17
Kimborg, Gus.	Tallahassee, R. R.		15
Kirkpatrick, John H.	Fort Pierce.		11
Kissimmee community herd.	Kissimmee.		10
Lamb, G. H.	Tallahassee.		40
Landers, Jas.	Tallahassee, R. 2, box 77.		10
Lane, T. W., Enterprise Dairy.	Tampa.		66
Laughlin Estate.	Zellwood.	23	
Lersch, H. C.	2315 College Avenue, Jacksonville.		12
Lowery, W. E.	Moncrief Avenue and Main Street, Jacksonville.		12
Lykes, T. M.	Tampa.		11
Lyman, R. E.	Dade City.		14
Lynn, T. J.	West Tampa.		18
McCourtney, Mrs. M. V.	Miami.		10
McDonald, S. D.	Gainesville, R. 2.		82
McDowell, W. S.	Jacksonville, box 287.		39
McKinlay, J. R.	Jacksonville, post-office box 476.		109

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
FLORIDA—continued.			
McKinstry, W. R.	Gainesville.		16
Mahaffey, L. F.	Gainesville, R. 5.		16
Maige, John.	Tallahassee.		16
Mansfield, G. H.	Gainesville, post-office box 187.		32
Meridith, Chas. A.	5815 East Bay Street, Jacksonville.		25
Massaro, Ferrante.	Ybor City, care Southern Feed Co.		16
Mickler & Perkins.	Tallahassee.		61
Mielonon, Pentti.	Eleventh and G Streets, Jacksonville.		10
Miller, C. W.	Plant City.		23
Miller, H. C.	Pensacola.		32
Miller, P. L.	St. Petersburg.		42
Mitchell, Frank.	Cocoanut Grove.		16
Moore, James.	Grand Crossing.		14
Moore, J. C., & Son.	Tallahassee.		10
Moore, M. E.	do.		25
Moore, W. B.	do.		27
Moore, W. W.	Pensacola, R. A. box 299.		11
Morgan, E. Y.	Pensacola, box 441.		58
Moseley, A. B.	Belleair, box 2.		14
Moseley, A. J.	Jacksonville, R. 6, box 331.		27
Hughes, J. H.	Orlando.		61
Mueller, J. E.	Gainesville, R. 4.	3	27
Nickerson, P. C.	South Jacksonville.		29
Niles, Edward.	Jacksonville, Highway, branch post office.		87
Nisrod, G. W.	Jacksonville.		12
Noble, H. L.	Pensacola.		70
Nolan, Wm. M.	Jacksonville, R. 6, box 186.		47
Ortega Dairy Co.	Jacksonville, R. 4, box 83.		25
Owen, H. L.	Gainesville.	2	28
Painter, W. C.	De Land.		24
Paret, G. A.	Dinsmore.	1	20
Parrott, J. W.	Miami.		19
Patterson, J. H., & Son.	Chaires.		21
Peebles, B.	Dade City.		28
Phelps, J. P.	Clearwater.		10
Pilcher, D. W.	Brooksville.		13
Pipps, W. H.	Valrico.		10
Poland, J. V.	Jacksonville, R. 5, box 99.		17
Popple, J. B.	Tallahassee.		13
Powell, W. H.	do.		24
Powell, W. J.	Pensacola.		22
Powers, Joe.	Florida City, post-office box 115.		16
Price, Dr. J. M.	Live Oak.		15
Prichard, C. C.	Miami, box 662.		35
Raa, H. B.	Tallahassee.		12
Ray, W. T.	Jacksonville, R. B, box 507.		20
Reisz, Peter.	Jacksonville, R. A, box 90.		155
Richbourg, W. J.	Gainesville, R. 4.		12
Ricker, Chas.	Jacksonville, R. A, box 395.		24
Ridgway, J. T.	Palatka.		29
Roberts, Wm.	Tallahassee, R. A.		13
Robinson, A. C.	Jacksonville, R. 4, box 260.		18
Rollins, Wm. E.	Jacksonville, R. 5, box 187.		29
Rose, C. B.	Little River.		21
Rosenblot, Sam.	Kings Road, Jacksonville.		11
Roukema, Chas.	Tampa, general delivery.		12
Rouse & Clark.	Jacksonville, R. A, box 530-B.		38
Russell, E. W.	Tallahassee.		11
Saleeba, Thos. M.	354 East Third Street, Jacksonville.		12
Schewdecker, Albert.	St. Petersburg.		29
Schuster, Wm.	Jacksonville.		17
Sellars, Geo. M.	St. Petersburg.		26
Sellars, J. S.	Miami, R. B, box 203.		13
Shader, I.	Orlando.		27
Shaw, C. R.	Quincy.		29
Shipe, I. W.	Fort Pierce.		42
Shultz, Mrs. J. A.	West Tampa.		55
Sierra, Ramon.	Ybor City.		34
Singer Stock Farm.	West Palm Beach.		44
Sniller, S. I.	230 West Twentieth Street, Jackson- ville.		17
Smith, Aubry.	Orlando.		16
Smith, W. H.	Jacksonville.		31
Spoto, Austina.	Ybor City.		22
Sopto, Zissippi.	Fifteenth Avenue, Ybor City.		14
Stacey, W. A.	Orlando.		27

Tuberculosis Eradication under the Accredited-Herd Plan. 65

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
FLORIDA—continued.			
Staple & Little.....	Sanford.....		50
Stark, T. S.....	Gainesville, R. 2, box 38.....		17
State Prison Farm.....	Raiford.....		104
Stegall, John W.....	Thomasville, Ga.....		56
Stringfield, J. W.....	Brooksville.....	1	27
Suwannee Farms.....	Live Oak.....	18	117
Tanner, L. T.....	Grand Crossing.....		12
Tampa Stock Farm.....	Tampa.....	69	23
Tanton, W. H.....	Pensacola, R. A, box 294.....		23
Taylor, John H.....	Ocala.....		13
Thomas, Oscar H.....	Gainesville.....		34
Thomas, W. H.....	Miami.....		16
Thomas, W. H.....	St. Petersburg.....		29
Thompson, John.....	Miami.....		12
Thompson, L. B.....	Pensacola.....		17
Trowell, C. I.....	Jacksonville, R. A, box 385.....		42
Vanderwort, Frank K.....	Ocala.....		14
Varn, Mrs. L. B.....	Brooksville.....	1	27
Vaughn, N. L.....	St. Petersburg.....		13
Vernon, John.....	Dade City.....		10
Voorhees, Geo. O.....	Cantonment.....		14
Wachild, Mrs. M.....	501 West Church Street, Jacksonville.....		11
Wadsworth, A. C.....	Orlando.....		18
Ward, C. Fred.....	Winter Park.....		41
Weaver, A.....	St. Petersburg.....		19
Webb, Q. C.....	Pensacola.....		25
Wehmeier, Fred.....	do.....		12
Wells, Lee.....	St. Petersburg.....		43
Wernicke, O. P.....	Brooksville, box 302.....		20
West, J. S.....	Jacksonville, R. B, box 295.....		13
Wheatley, W. F.....	Jacksonville, R. 2, box 414.....		35
White, Mrs. J. C.....	Tallahassee.....		16
Wiggins, John L. & John A.....	Pensacola, box 1234.....		18
Wilcher, J. J.....	Seventeenth Street and Tallarand Avenue, Jacksonville.....		11
Wilder, R. L.....	Tampa, box 762.....	1	103
Wilkins, Estelle.....	Pensacola.....		24
Willet, A. H.....	Orlando.....		21
Willie, J. J.....	Lloyd.....		16
Wimingham, G. W.....	Tampa, R. 5, Chaplin Avenue.....		10
Wood, D. M.....	Lovette.....		10
Yokum, James.....	Twentieth Street, Jacksonville, R. 2, box 438.....		14
GEORGIA.			
Adams, J. R.....	Atlanta, R. 5.....		18
Anglin, M. M.....	Atlanta, R. 3.....		16
Anderson, Gust.....	Americus.....		30
Atlanta City Dairy Farm.....	Atlanta.....		63
Ballard, W. K.....	Atlanta, R. 2.....		15
Bennett, C. L.....	Jefferson, R. 5.....		21
Berry School.....	Rome.....	8	94
Breedlove, W. L., & Son.....	Monroe.....	18	38
Brown, J. F.....	Shiloh.....		15
Buchanan, E. E.....	Woodland.....		11
Buchanan, G. S.....	Shiloh.....		13
Buchanan, T. E.....	do.....		13
Chandler Bros.....	Milledgeville.....	44	21
Chapman, H. D.....	Shiloh.....		45
Chapman, John H.....	do.....		13
Chapman, W. D.....	do.....		12
Christian, J. W.....	Rossville, R. 2.....		13
Christian, T. W.....	do.....		14
Clay, J. C.....	East Atlanta, R. 3.....		15
Clay, Luther.....	do.....		14
Collier, J. E.....	Atlanta, R. 3.....		16
Cook, Mrs. Dallas.....	Rock Spring, R. 1.....		11
Cowan, P. C.....	Conley.....		37
Crammere, John.....	Ringgold, R. 3.....		18
Daniel Bros.....	Hogansville.....	41	61
Daniel, J. E.....	Atlanta.....		101
Duggan, T. R.....	Warthen.....		31
Elliott, J. A.....	Rossville, R. 1.....		13
Elliott, T. H.....	do.....		29
Foster, A. B.....	Shiloh.....		11

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
GEORGIA—continued.			
French, A. A.	Atlanta, R. 3.		30
Garrett, E. E.	Woodland.		16
Georgia State Sanitarium.	Milledgeville.	6	182
Gladden, E.	Decatur, R. 3.		13
Gresham, J. W.	Griffin.	17	
Hendricks, W. B.	Woodland.		14
Hewett, C. G.	1071 Highland Avenue, Atlanta.		32
Hodgson, F. M.	296 Boulevard, Athens.	15	
Hooks, J. H.	Warthen.	74	79
Howard, S. E.	Woodland.		12
Johnson, C. C.	Decatur, R. 3.		57
Kellum, J. F.	Shiloh.		11
Key, G. M.	Atlanta, R. 8.		12
Knox, W. S.	Alton Park, Tenn.		10
Lakeview Farm.	Decatur.		43
Lay, H. G.	Calhoun.		24
Leake, J. W.	Rossville, R. 1.		28
Lietch, J. G.	Atlanta.		33
Lloyd, W. H.	East Atlanta.		12
Moore, H. D. & J. D.	Conley.		64
Napier, T. C.	Ringgold, R. 1.		14
Nix, W. T.	Commerce, R. 12.		14
Nichols, O.	Atlanta, R. 3.		41
Norman, W. G.	Griffin.	7	
Owens, Sam.	Calhoun.	2	11
Parker, J. A.	East Point, R. 2.		52
Parks, M. L.	Atlanta, R. 3.		35
Parks, M. N.	do.		22
Peek, J. C.	Atlanta.		14
Porter, John.	Decatur.		28
Preston, E. B.	Midland.		39
Preston, E. E.	Columbus.		45
Pursley, R. S.	Chickamauga.		14
Reeves, J. L.	Calhoun.		10
Russell, W. H.	Shiloh.		12
Russell, W. L.	Shiloh, R. 1.		10
Ryal, S. G.	Savannah, box 1005.		112
Scott, C. E.	Decatur, R. 1.		21
Selman, G. C.	Monroe.		50
Shorter College.	Rome.		18
Sprayberry, J. F.	East Atlanta.		29
State College of Agriculture.	Athens.	20	
Strouss, J. W.	Atlanta, R. 8.		21
Tanner & Clay.	Milledgeville.		46
Thomasville Live Stock Co.	Thomasville.	34	
Tippen, R. S.	Acworth.	22	2
United States Penitentiary.	Atlanta.		32
Wade, B. L.	55 Rockyford Avenue, Kirkwood.		25
Warren, M. L.	East Atlanta, R. 3.		42
Webster, A. J.	Shiloh.		13
Wells, E. R.	Wildwood, R. 1.		10
Whatley, J. G.	Adairsville.	6	
Wheeler, J. L.	Decatur, R. 1.		52
White, G. W.	Columbus.		70
Williams, Felix.	Villa Rica.	25	
Williams, J. E.	Ringgold, R. 1.		13
Williams, Lee J.	Carrollton.		24
Williams, L. R.	Rossville, R. 2.		18
IDAHO.			
Archibald, Thos.	Rexburg.		11
Beeson, Bros.	Wendell.	3	11
Beito, Ole.	Rathdrum.		11
Boner, Joe.	do.		14
Bates, S. A.	Dietrich.		15
Bell, Eli.	Rexburg.		16
Bentley, D.	Cocolalla.		11
Briggs, C. B.	Rexburg.	1	16
Bartley, T. W.	Moscow.	7	1
Bumgarner, C. M.	Nampa.	50	
Cannon, C. Y.	Boise.	23	
Childs, Geo. A.	Buhl.	15	
Clark, D. F.	Kimberly.	2	27
Castor, C. G.	St. Maries.		23
Currier, Charles A.	Winchester.		11
Clark, John H.	Wendell.		12
Dayton, D. P.	Naples.	9	

Tuberculosis Eradication under the Accredited-Herd Plan. 67

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
IDAHO—continued.			
Dille, L. S.	Caldwell	32	..
Daubner Bros.	Twin Falls	1	23
Drake, G. A.	Filer	1	22
Edwards, Thos. H.	Dietrich		10
Enfield, W. H.	Montpelier		35
Eliason, Edward	Cocolalla		10
Erickson, Herman	Archer		10
Francher & Leigh	Buhl	11	35
Ford, Matthew	Wendell	2	16
Foster, M.	....do.		17
Gearhart, S. E.	Boise	27	3
Gillard Bros.	Bonnors Ferry		23
Heing, Jacob	Rexburg		12
Howe, Mrs. Anna	Coeur d'Alene		23
Hymas, S. E.	Sharon	1	19
Holltey, Mrs. C. P.	Emmett		13
Hames, L. S.	Caldwell	2	13
Haynes, G. W.	Eagle	20	6
Hurst, B. F.	Boise	24	13
Irwin, C. D.	Twin Falls	22	20
Johnson, O. C.	Archer		11
Jeppson, C. O.	....do.	1	17
Johnson, Axel	Payette	1	9
Jones, R. F.	Winchester		10
Kuka, F. W.	Shoshone		16
Lott, Jno. S.	Menan	2	9
Lundstrum, A.	St. Maries	1	38
Lichty, C. E.	Hansen		32
Lyons, L. V.	Post Falls		21
McPhearson, B. F.	Filer	8	9
McNealy, O. E.	Careywood		10
McClenahan, J. H.	Boise	7	
McGowan, Cora M.	Dietrich		16
McComb, David	Buhl		11
Mason, J. T.	Parker		20
Mauvais, J. N.	Gooding		11
McHarg, J. B.	....do.		10
Merrill, E. W.	Menan		10
Otto, L. S.	Filer	3	4
Osborne, Earl	Cocolalla		12
Payette Purchasing Association	Payette	31	..
Prather, V. B.	Gooding		22
Parker, M.	Wendell		15
Price, W. M.	Filer	2	6
Qualls, R. W.	Buhl	9	1
Rand, Jno.	Cocolalla		10
Randall, H. L.	Boise		10
Remington, J. J.	Parker		10
Renk, H. J.	Boise	1	11
Reaves, A. S.	Wendell	3	17
Swanson, Charlie	Cocolalla		12
Shaw, Peter	....do.	1	17
Spencer, F. L.	New Plymouth		19
Shades, A. G.	Churchill	24	5
Spencer, W. H.	Careywood		12
Sherwood, F. H.	Emmett	9	1
Shotwell, W. M.	Twin Falls	11	12
Southwick, F. E.	Wendell	1	24
Thompson, Jas. L.	St. Anthony		13
Teeter, W. L.	Meridian	2	21
Waggoner, Chas.	Post Falls	2	12
Weir, Dave	Rathdrum	1	11
Young, Stillman	St. Anthony		19
ILLINOIS.			
Baldwin, W. R.	Delavan	8	1
Belshe, E. L.	Norwood Park	32	..
Coddington, F. H.	Princeton	1	16
Donegan, P. H.	Waukegan	11	..
Garrard, Otto	Robinson	1	24
Goodwin, N. F.	Palestine	1	12
Harshman, P. B.	Sullivan	19	..
Headley, C. V.	Palestine		15
Honey, Chas.	Newton	14	..
Honey, John	West Liberty	3	12
Judy, C. C.	Tallula	102	2
Lewis, Elmer	Dieterich	2	5

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
IDAHO—continued.			
Lepper, Edward.....	Quincy.....	8	.....
Lepper, Ira.....	do.....	1	12
Mast, Casper L.....	do.....	11	.....
Mast, Lawrence B.....	do.....	10	1
Meserve, A. G.....	Robinson.....	5	.....
Miller, L. A.....	Arthur.....	1	49
Miller, M. L.....	do.....	.....	25
Mills, A. Lawrence.....	Highland Park.....	7	.....
O'Hair, W. S., & Son.....	Paris.....	43	.....
Patterson, Clyde O.....	Sullivan.....	16	.....
Phelps, Earl W.....	Quincy.....	4	7
Pifer, E. E.....	Palestine.....	6	10
Schrock, Eli J.....	Arthur.....	.....	10
Skinner, F. H.....	Fairbury.....	12	.....
Tomlinson, C. S.....	Rossville.....	33	.....
West, Walter B.....	Ottawa.....	21	4
Winsor, J. P.....	Morris.....	13	.....
Yoder, A. J.....	Arthur.....	1	27
INDIANA.			
Abel & Sons, Dr. O. E.....	Modoc.....	22	.....
Allen, Ellis E.....	Salem.....	2	11
Andrews, Fred W.....	Aurora.....	.....	17
Baynes, Raymond C.....	Salem.....	7	20
Bean, Prof. W. D.....	Corydon.....	17	1
Bennett, Roy.....	Guilford.....	.....	10
Benthall, John D.....	Mount Vernon.....	1	14
Bloom, Stanley W.....	Aurora.....	.....	13
Booth, W. H.....	Seymour.....	19	12
Brakemeier, Phil J.....	Princeton.....	4	11
Brandt, Herman.....	Aurora.....	.....	20
Busee, H. L.....	do.....	.....	10
Byers, Paul.....	Franklin.....	.....	36
Calvin, Vere S.....	Kewanna.....	3	31
Canfield, Roy.....	Aurora.....	.....	10
Carr, John T.....	Charlestown.....	38	7
Carithers, Joseph, jr.....	Princeton.....	1	19
Cotton, J. I.....	Aurora.....	.....	13
Dellinger, G. L.....	Memphis.....	1	17
Deming & Deming.....	Franklin.....	4	22
Denham & Greer.....	Charlestown.....	8	32
Dillman & Sailor.....	Goshen.....	16	2
Favorite, Herman.....	Huntington.....	.....	12
Feldwisch & Son.....	Booneville.....	10	14
Fisher, Avery.....	Elberfeld.....	6	9
Givan, Anna C.....	Lawrenceburg.....	9	10
Givan & Son, J. J.....	Aurora.....	6	.....
Grimwood, Herbert.....	Inglefield.....	4	10
Hall, E. A.....	Guilford.....	5	18
Hall, Dr. R. J.....	Rushville.....	18	.....
Hein, Ernst.....	Elberfeld.....	19	.....
Hein, Fred.....	Inglefield.....	15	8
Hellmich, Henry A.....	Greensburg.....	35	5
Henson, C. E.....	Terre Haute.....	5	9
Hickman, Harry G.....	Winchester.....	5	7
Hill & Co., G. W.....	Shelbyville.....	18	.....
Hill, L. F.....	Winchester.....	1	17
Hoppmire, Ernest.....	Aurora.....	.....	12
Humble & McCarty.....	Pendleton.....	.....	11
Jacques, James.....	Logan.....	.....	16
Johnson, A. C.....	Straughn.....	1	13
Johnson, M. L.....	do.....	4	14
Johnson, P. L.....	Vincennes.....	13	18
Johnston, R. C.....	Aurora.....	.....	12
King, A. D.....	Muncie.....	12	4
Kuhlenschmidts, W. C.....	Elberfeld.....	3	16
Kyle, Raymond G.....	Aurora.....	10	2
Lange, Herman.....	do.....	.....	10
Lattire, George.....	Lawrenceburg.....	1	11
Leptak, Henry.....	do.....	.....	16
Likens, E. M.....	Elwood.....	31	4
Lindenmeyer, G. H.....	Otisco.....	3	12
Linke, Frank.....	Seymour.....	8	15
Linke, Hardin.....	Columbus.....	6	12
Longdon & Adams.....	Rockville.....	1	23
Louisville Cement Co.....	Sellersburg.....	5	29

Tuberculosis Eradication under the Accredited-Herd Plan. 69

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
INDIANA—continued.			
Lutz, E. R.	Guilford	7	6
Lutz, Frank	do.		26
Lutz, George M.	do.		30
McKenzie, J. H.	Brazil.		15
Mahon, Albert J.	Underwood.	9	13
Means & Harrison	Charlestown.	1	19
Mills, E. S.	Indianapolis, R. O. 225.	35	
Morris, Charles.	Aurora.	1	14
Odle, O. M.	Muncie.	2	16
Orr, Frank T.	Patriot.	2	13
Painter, H. W. & C. D.	Spiceiland.	2	24
Peck, C. E.	Armstrong.	10	
Powers, Harry.	Union City.	7	
Reid, W. V.	Richmond.	12	4
Riggs, Richard W.	Inglefield.	15	8
Sanders, O. B.	Terre Haute.		15
Schrock, Victor.	Goshen.		15
Sheldon, Salem P.	Patriot.	5	10
Shirley, P. G.	Ingalls.	11	2
Shugart, Arthur E.	Marion.	9	11
Shuter, Harry.	Aurora.		15
Suhre, Fred.	Columbus.	9	13
Thomas, John L.	Pendleton.		13
Trennepohl, Fred.	Aurora.	5	13
Trible, J. O.	Shelbyville.	5	3
Van Pelt, J. W.	Charlestown.	7	7
Volkmann, Otto.	Inglefield.	6	26
Volkmann, W. G.	Francisco.	1	11
Voshell, C. L.	Moore's Hill.	3	10
Watson, U. G.	Corydon.	14	
Weinmann, V. F.	Guilford.		16
Wilt & Bond.	Newcastle.	2	14
Witte, Mrs. Caroline.	Aurora.		18
Woods, M. S.	Princeton.	7	12
Yoder, Levi R.	Middlebury.	6	
IOWA.			
Iowa State College.	Ames.	17	
Kinsley, R. G. & B. A.	McGregor.	58	
Long, Isaac.	Altoona.	12	2
Miller, S. D., & Son.	Wellman.		17
Rietveld, Herman.	Fairfield.	23	
Sac and Fox Sanatorium.	Toledo.	23	3
Shephard, Chas. J.	Muscataine.	2	18
Sterling, G. C.	Des Moines, R. 6.	14	2
Swaney Bros.	Grinnell, R. 3.	13	26
Waterloo Jersey Farms:			
Glenn Barron Farm.	Waterloo, R. 4.	14	16
Jas. H. Frush Farm.	Waterloo.	30	
L. R. Sisson Farm.	Jesup.	17	
Will Thompson Farm.	do.	49	
Webster, M. A.	Fairfield.	13	1
Weisbrod, W. P.	Fenton.	10	4
KANSAS.			
Arthur, W. C.	Burlington.	6	2
Copeland, B. C.	Clay Center.	1	7
Coop, Albert J.	La Harpe.	39	
Comp, J. A.	White City.	19	1
Davis, W. E.	Emporia, R. 8.	2	10
Gibson, Mark G.	Chanute.	5	14
King, W. E.	Washington.	16	
Kramer, D. A.	do.	7	
Latta, E. C.	Holton.	9	
Massey, Ralf N.	Sun City.	17	2
Purkey, W. F.	Chanute.	5	9
Randolph, G. H.	Emporia.	9	19
Stevenson, J. L.	do.	12	4
Sperry, B. D.	Barnes.	12	
Stalder, Fred.	Meade.	12	4
Schiess, Sam.	Florence.	2	13
Swingle, A. J.	Leonardville.	6	1
Turner, W. F.	Horton.	14	8
Woerner, Floyd.	Clay Center.	1	18
Williams Bros.	Oswego.	5	16

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
KENTUCKY.			
Adams Bros.	Skylight		21
Adams, C. N.	Princeton		11
Alke, Albert	Augusta	5	13
Aubrey, F. M.	Lexington		19
Ball, E. E.	California		17
Baughman, John S.	Danville		12
Bennett, Walter	La Grange		16
Benedict, T. L.	Oneonta		14
Bingham, O. A.	Bowling Green	2	28
Bird, Ira W.	Crittenden	9	10
Blackman, Otis	Nicholasville		21
Blakemore, J. I.	Lawrenceburg		15
Boyd, Lee L.	Minerva		11
Bradshaw, J. C. & A. M.	Trenton		28
Bright's Inn Farm	Stanford	1	37
Brown & Hanna Realty Co.	Louisville		59
Brown, Fred G.	Crittenden		11
Bugg, T. A.	Fredonia	1	26
Caminisch, J. B.	Stanford	29	3
Campbell, H. S.	Jett		10
Cook, Lew.	Ft. Thomas		17
Cox, W. A.	Versailles	8	4
Crider Creamery Co.	Fredonia		61
Currens, C. B.	Burgin	21	3
Davis, J. R.	Maysville	15	7
Dean, James A.	Glen Dean		21
Dicken, Henry	California		14
Dickey, M. W.	Berry	10	2
Edelen, Allen S.	Burgin	17	5
Edward, J. T.	Nicholasville	4	14
Franklin, E. H.	Shelbyville	7	38
Fox, C. N.	Elkton	11	10
Fulcher, J. W.	Pembroke	8	
Froman & Adams	Carrollton		18
Gannon, T. F.	Lexington		41
Gary, R. C. & Son	Hopkinsville	14	25
Gaines, P. B.	Carrollton	102	58
Godby, Dr. D. M.	Perryville	13	4
Graves, B. B.	Frankfort		15
Grumley, J. S.	Elkton	7	10
Hackett, W. O.	Richmond		19
Hafer, O. C.	Hebron	6	17
Hampton, W. W., & Son	Goshen	24	
Hartke, Henry	Covington	29	13
Harris, G. P., & Son	Carrollton	42	15
Hill, Ed., jr.	do.	4	20
Hollins, W. M.	Elkton	12	5
Hays Bros.	La Grange		13
Jackson, Thos.	Danville	13	5
Kentucky Agricultural Experiment Station.	Lexington	53	9
Kentucky Normal and Industrial Insti- tute.	Frankfort	13	3
Kite, W. G.	Burlington	32	1
Ling, T. G.	California	1	12
McBurney, Frank	Smithfield	1	14
McDannell, J. H.	Warsaw	42	
McEldowney, T. M.	Winchester	2	8
McKibbin, J. D.	Augusta	11	
McKinney, J. R.	Richmond		19
Miller, A.	Berry		10
Miller, R. F.	do.		10
Minor, P. O.	Owenton	43	
Morris, A. E.	Hopkinsville	29	18
Morris, J. M.	do.	2	78
Morris, Sam G.	do.	7	
Paddock, Benj.	Hebron	3	10
Parks, W. C.	Danville		14
Pennick & Malone	Russellville	15	52
Perrant Bros.	Dover	25	10
Petrie, J. E.	Elkton	33	35
Powell, T. L.	La Grange		25
Pyles, W. E.	Maysville	3	22
Ramey, Jas. R.	Carrollton	2	12
Rice, Luther	Paris	1	12
Riebel, Geo. F., jr.	Skylight		19
Rouse, H.	Crittenden	10	

Tuberculosis Eradication under the Accredited-Herd Plan. 71

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
KENTUCKY—continued.			
Rule, Rev. John.....	Goshen.....	14	1
Russell, Geo. T.....	La Grange.....	2	48
Ryle, S. B.....	Grant.....	13	1
St. Vincent Academy.....	St. Vincent.....		36
Satterwhite, A. J.....	Farmdale.....		16
Scott, C. P.....	Ghent.....	4	12
Scott, D. C.....	Hutchison.....	1	35
Sherwood, J. W.....	Lawrenceburg.....		13
Shoemaker, J. C.....	Falmouth.....	1	20
Smoot, W. B.....	Augusta.....	3	7
Sonsley, Roy J.....	Hopkinsville.....	12	
Stowe, Chas. H.....	do.....	2	10
Stowe, G. H.....	do.....	27	
Summers, L. A.....	Gracey.....	1	29
Swain, H. E.....	Smithfield.....		11
Terrill, J. H.....	Elkton.....	3	13
Troutman, O. F.....	Nicholasville.....	9	29
Vandolah, W. E.....	La Grange.....		40
Vimont, Letton.....	Paris.....	17	7
Von Gruenigan, Albert.....	Stanford.....	7	26
Von Gruenigan, Fred.....	do.....	18	19
Walker, Wm.....	Hopkinsville.....	1	20
Weeks, Swayne.....	Crestwood.....		11
Weimer, Geo. S.....	Augusta.....	7	
Williams, E. N.....	Lexington.....		28
Wingfield, E. A.....	La Grange.....	5	3
Yancey, Raymond.....	Hopkinsville.....	19	
Zaring, A. L.....	Crestwood.....		16
Yancey, Frank.....	Elkton.....	6	7
LOUISIANA.			
Alford, H. N.....	Amite.....		14
Alford, S. J.....	Kentwood.....		13
Anthony, L.....	Hammond.....		41
Bolloffe, G.....	do.....		21
Bridges, Henry.....	Tangipahoa.....		18
Bridges, Jack.....	do.....		18
Bridges, J. J.....	do.....		17
Bridges, Joel.....	do.....		30
Brodham, J. S.....	Kentwood.....	13	
Brodley, U. S.....	Fluker.....		16
Carter, W. H.....	Hammond.....		27
Cyples, A.....	do.....	5	24
Day, H. D.....	Kentwood.....		28
Day, M.....	do.....		20
Dodspn, Prof. R. W.....	Baton Rouge.....	6	17
Dyson, W. E.....	Kentwood.....		24
Easley, R. T.....	Tangipahoa.....		71
Ellis, Mrs. M. K.....	Kentwood.....	2	59
Frazier, J. P.....	do.....		11
Hutchinson, H. E.....	Tangipahoa.....		20
Hyde, C. A.....	Fluker.....		20
Hyde, C. J.....	do.....	9	23
Johns, Dr. J. B.....	Stonewall.....	9	45
Keator, Dr. J. T.....	Bermuda.....	11	1
Kliesch, T. A.....	Post office, Osyka, Miss.....		23
Louisiana State University.....	Baton Rouge.....	29	5
McDaniel, L. H.....	Kentwood.....		13
Minor Estate.....	Houma.....	3	12
Moore, Sam.....	Tangipahoa.....		23
Morgan, W. T.....	Fluker.....		18
Morris-Day Co.....	Kentwood.....		51
Munch, Jake.....	New Orleans.....		12
Neetham, J. T.....	Kentwood.....		25
Newman, J. A.....	do.....		14
Newsom, J. E.....	Tangipahoa.....	1	59
Passon, Robert.....	New Iberia.....	3	54
Pounder, L. B.....	Amite.....		13
Powell, J. A.....	Kentwood.....		18
Price, W. A.....	do.....		29
Do.....	do.....		23
Raley, R. E.....	do.....		18
Raley, R. T.....	do.....		29
Reeves, J. C.....	Tangipahoa.....		10
Schwartz, N. G.....	Kentwood.....		21
Schwartz, Utis.....	do.....		34

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
LOUISIANA—continued.			
Shaffer, R. B.	Ellendale	1	34
Shall, M. A.	Harahan		21
Simmonds, M. W.	Kentwood		12
Smith, C. L.	do.		17
Smith, H. J.	do.		12
Smith, L. H.	do.		19
Southwestern Industrial Institute	La Fayette	6	21
Strickland, H. T.	Tangipahoa		21
Supple, J. W., Planting Co.	Bayou Goula		40
Swearinger, J. T.	Kentwood		18
Tariere Dairy	Burwick	1	41
Terry, C. P.	Post office, Osyka, Miss.		26
Tyler, C. T.	Amite	1	14
Tyner, E. T.	Kentwood		29
Venable, W. E.	Tangipahoa		12
Vernon, E. T.	Fluker		35
Wall, J. P.	Tangipahoa		22
Waller, Jules W.	do.		20
Young, M. P.	Kentwood		10
Young, R. M.	do.		35
Young, W. J.	Tangipahoa		11
MAINE.			
Abbott, A. D., & Son.	North Vassalboro.		7
Adams, A. H.	Canton Point.		28
Adkins, Fred E.	Livermore Falls, R. 2.	1	14
Albert, Peter.	Winn.	6	5
Alley, W. E.	North Vassalboro, R. 49.	1	9
Ames, Frank S.	Machias.	7	5
Ash, Nathan.	Bar Harbor.		11
Ayredale Stock Farm.	Bangor.	134	
Babbidge, Chas.	North Brooksville.		10
Bailey, C. E.	North Vassalboro.		13
Bellows, Charles E.	Freedom.	4	18
Bisbee Bros.	Canton.	10	6
Blaisdell, Geo.	Mercer.	1	14
Blanchard, Fred S.	Cumberland Center.	8	17
Boothby, R. H.	Livermore Falls.	6	45
Bowdoin, Geo.	Harmony.		31
Boynton, P. L.	Liberty.		14
Bragg, H. E.	North Vassalboro.	1	10
Briggs, C. S.	Turner, R. 2.	3	13
Burgess, F. O.	North Vassalboro.	1	18
Cannon, Roy.	Oakland.		13
Chadbourne, A. L.	Harmony.		19
Chapman, Everett T.	Harrison, R. R.	2	8
Chipman, Geo. E.	South Poland.		11
Clement, Frank H.	West Penobscot.		10
Clough, Richard.	Monmouth.	1	9
Cook, D. A.	Oakland.	7	6
Cooley, Henry.	Brigham.	14	
Cottle, A. G.	Houlton.	16	29
Cousins, Horace.	Waterville.		17
Cunningham, E. L.	Bangor.		11
Curtis, E. W.	Waterville.		11
Cushman, F. H.	do.	2	14
Davis, E. E.	Greene.	6	
Denton, L. H.	Caribou.	4	7
Doc, A. E.	Vassalboro.		15
Doc, Frank E.	Fairfield Center.	7	
Doughty, T. B.	Norway, R. 2.	6	6
Downer, E. W.	Freedom.	4	8
Drummond, Scott H.	Winslow.		14
Dudley, Harvey.	Strickland.		12
Dunbar, H. W.	East Sullivan.		14
Edgecomb, F. W.	Cornish.	2	10
Farrington, C. W.	Fryeburg.	28	1
Field, Chas. F.	Cumberland Center.	9	7
Fogg, Lester L.	Greene.	5	4
Ford Bros.	Brewer.	1	10
Fotel, Geo.	Waterville.		20
French, Geo. H.	Turner.		12
Gifford, E. S.	Auburn.	22	
Gordon, J. H.	Livermore.	11	16
Green, H. F.	Houlton.	2	10

Tuberculosis Eradication under the Accredited-Herd Plan. 73

JERSEY—Continued.

Name.	Address.	Cattle once tested with- cut reactors.	
		Purebred.	Grade.
MAINE—continued.			
Hallee, Oscar.....	North Vassalboro.....		12
Hanna, E. A.....	Ashville.....		12
Harding, E. C.....	South Union.....		14
Hardy, Herbert.....	Hope.....		10
Hart, C. H.....	Brewer.....	2	16
Haslam, M. W.....	Waltham.....		14
Haynes, Guy C.....	Vassalboro.....	1	10
Heikkinen, Antti.....	Livermore Falls.....		12
Highacre Farm.....	Bangor.....	65	
Hill, Mrs. F. E.....	Calais.....	1	12
Hinkley, E. E.....	North Livermore.....	1	13
Hosmer, Addison A.....	East Wilton.....	3	8
Howe, Paul H.....	Norway.....		16
Howe, T. N.....	Greene.....	1	20
Innes, Chas. H.....	Saco.....	13	
Jones, R. O.....	Winslow.....	16	
Jones, Wallace.....	North Vassalboro.....		12
Jordan, Harvey H.....	Waltham.....		19
Judd, J. H.....	Greene.....	9	3
Kelley, Geo.....	Mercer.....		14
Leach, Irving L.....	Blue Hill.....		20
Leathers, O. C.....	Kenduskeag.....	9	8
Leonard, Arthur W.....	Thorndike.....	1	18
Levanseller Bros.....	Waldo.....	13	1
Levine, L.....	Waterville.....		18
Libby, O. B.....	Warren.....	8	16
Luce, C. E. & A. J.....	Farmington.....	5	20
Luce, G. M. & F. C.....	do.....	31	
Lufkin, H. G.....	Levant.....	4	16
Mansur, Leroy.....	Monroe.....	2	16
Mason, Fred.....	Waterville.....		10
McIntire, A. R.....	Fairfield.....		11
Means, L. F.....	do.....		13
Mills, Horace.....	West Brooksville.....		10
Mingo, Arthur.....	Fairfield.....		11
Moody, Edgar M.....	Union.....		14
Moore, E. L.....	Livermore Falls.....		14
Moore, V. G.....	Bangor.....		17
Morey, Chas. E.....	Mechanic Falls.....	20	6
Morse & Son, F. H.....	Waterford.....	5	26
Moulton, H. M.....	Cumberland Center.....	41	
Mount Merici Convent.....	Waterville.....		28
Noyes, C. W.....	East Wilton.....	11	11
Noyes, E. D.....	Fairfield.....	3	15
Oliver, Geo. E.....	Waterville.....		23
Oreutt, Raymond.....	East Sullivan.....		10
Palmer, J. F.....	East Sumner.....	9	3
Perkins, John F.....	Levant.....	8	12
Perley, Fred B.....	Vassalboro.....	34	
Pierce, Greenleaf.....	Berwick.....		13
Pierce, Ingraham C.....	Brigham.....	19	4
Pike & Sons, J. J.....	East Brownfield.....	1	23
Pinkham, C. A.....	North Vassalboro.....	1	12
Pope & Sons, C. S.....	Manchester.....	36	
Porter, Richard.....	Washburn.....	1	9
Priest, Ernest R.....	North Vassalboro.....	8	8
Rand, Frank.....	do.....		14
Redfern, Ralph B.....	Yarmouth.....	23	
Richmond, Floyd.....	Strickland.....	1	16
Ricker, Ella J.....	Harmony.....		13
Ricker & Son, F. A.....	Turner.....	13	12
Roberts, John.....	Alfred.....	6	21
Robinson, J. P.....	East Sumner.....	10	2
Rose, Nelson.....	Dixfield.....	18	
Rugan, Frank.....	Houlton.....	1	15
Russell, Theodore.....	Livermore.....		11
Salsbury, George.....	Fairfield.....		12
Sanborn, M. B.....	Greene.....		14
Sanderson, A. L.....	Harrison.....	1	16
Savage, Edgar W.....	Farmington.....	5	8
Shorey, C. F.....	North Vassalboro.....		11
Simpson, George.....	Waterville.....		20
Smith, Elbridge, & Son.....	West Kennebunk.....	5	3
Smith, Walter.....	Brewer.....		10
Soper, Geo. I.....	North Penobscot.....		11
Staples, W. H.....	Limerick.....		10
Stevens, A. Herbert.....	Livermore Falls.....	5	8

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MAINE—continued.			
Stewart, Daniel E.	Richmond.	14	
Sylvester, S. R.	Greene.	2	8
Taylor & Son, J.	West Kennebunk.		13
Thurston, Young A.	Andover.	4	8
Tobey, L. J.	Fairfield.		13
Totman, Hiram W.	Topsham.	21	
Towle, Albion P.	Newfield.		11
Towle, E. N.	North Vassalboro.	15	11
Townsend, W. S.	Newport.	27	6
Tyler, Frank C.	Freedom.		11
Underwood, J. H.	Kents Hill.	34	
Wadsworth, W. D.	Cornish.	7	8
Wallace, R. A.	South Union.	5	11
Ward, O. U. G.	North Vassalboro.		14
Washburn, Lillian.	Livermore Falls.	11	
Watson, A. P.	Oakland.	5	5
Webber, Philip R.	Bangor.		11
Wentworth, Geo. W.	North Vassalboro.		12
Wentworth & Hyson.	do.		10
Wilson, Howard G.	Augusta.		12
Winslow, I. O.	Winthrop.		23
MARYLAND.			
Athey, H. E.	Keedysville.	7	2
Bailey, W. F.	Forest Hill.		12
Boyd, Jas. L.	Street.		13
Caulk, Owen.	Trappe.	34	
Clemens, C. E.	Brooklandville.	5	
Close, Phillip T.	Bel Air.	5	
Cummings, Andrew.	Street.	1	12
Dawson, T. J.	Cumberland.		11
Dickens, H. M.	Cumberland, R. 3.		11
Dunnington, W. W.	Seat Pleasant.		11
Forbes, Theodore.	Fallston.	10	2
Gorman, Mrs. G. Norris.	Laurel.		15
Graham, A. B.	Trappe.		11
Gray, J. Ernest.	Forest Hill.	2	17
Harlan, J. Maurice.	Fallston.	9	3
Hillan, Mrs. T. O'Donnell.	Eccleston.	25	
Hutchinson, M. J.	Cordova.		10
Lochary, Fred.	Bel Air, R. 3.		20
McKee, T. A.	Contee.		13
Marlow, W. H., jr.	College Park.		16
Moxley, J. E.	Bel Air, R. 3.		27
Osborne, M. C.	Bel Air.	21	
Poplin, S. D.	do.		26
Silver, Geo. E.	Darlington.	5	8
Smith, Martin H.	Annapolis.	7	
Smith, Robt. J.	Easton.	3	21
Stuart, J. T.	Bel Air.		21
Thomas, E. E.	do.		16
Wallis, Hugh.	Wheaton.		18
Webster, E. H.	Bel Air.		19
Webster, Jno. S.	Aberdeen, R. R.	3	17
Wilson, T. W.	Forest Hill.	22	3
Wimsatt, W. A.	Silver Spring.	11	
Wisner, Mrs. Sally.	Sparks.		10
Yoder, Albert U.	Grantsville, post office, Elk Lick, Pa.		16
Yoder, Ed. M.	Grantsville.	1	20
Yoder, Saml. U.	Grantsville; post office, Elk Lick, Pa.	3	14
MASSACHUSETTS.			
Almy, Frederick S.	West Wrentham.	10	
Brady, M. L.	Uxbridge.	8	
Braque, L. H.	Hinsdale.	6	
Cornish, Miss Gertrude E.	Norton.	17	3
Field, W. B. Osgood.	Lenox.	37	11
Foster, Girard.	do.	16	
Gage, Dr. J. Arthur.	Lowell.	12	10
Garfield, Mason.	Concord.	22	
Sibley, John R.	Spencer.	116	
Stoughton, L. E.	Turners Falls.	22	
Willet, Howard.	New Marlboro.	47	

Tuberculosis Eradication under the Accredited-Herd Plan. 75

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MICHIGAN.			
Alban, Geo. L., & Sons.....	Clinton.....	16	2
Bliss, E. L.....	Silver Creek.....	25	
Eardley, J. F.....	Grand Rapids.....	13	
Sanderson, A. D., & Son.....	Blissfield.....	8	
Walker, Chas. H.....	Byron Center.....	8	8
Whipple, H. C.....	Augusta.....	32	
MINNESOTA.			
Hanske, Ed.....	St. Hilaire.....		18
Holker, A.....	Hamel.....	8	
Howe, E. K.....	Alden.....	5	11
Indian School.....	Pipestone.....		45
Lintner, Wm. M.....	Farmington.....	1	9
Manchester, Edw. V.....	Hopkins.....	11	6
Nobles, N. R.....	Sumter.....		26
O'Donnell, F.....	Rush City.....	3	7
Olsen, Edw. A.....	Nelson.....	5	11
Passe, F. H.....	Wabasha.....	12	15
Plank, R.....	Wayzata.....	5	
Sanken, H. W.....	Brown-ton.....	4	20
Sanderson, Geo. H.....	Anoka.....	4	4
Senne, C. N.....	Fairmont.....		15
University of Minnesota Dairy Farm.....	St. Paul.....	22	
White, C. H., & F. W.....	Marshall.....	58	25
Wiganowsky, L. E.....	Morristown.....	18	8
MISSISSIPPI.			
Alcorn Agricultural and Mechanical College.....	Lorman.....		28
Aycock, E. L.....	Macon.....		30
Bailey & Millender.....	Aberdeen.....		15
Bailey, P. G.....	Kosciusko.....		13
Bailey, P. S.....	Oakland.....		12
Banks, N. H.....	Philadelphia.....		15
Bardwell, C. C.....	Starkville.....	33	44
Beall, B. S., jr.....	Lexington.....	10	1
Black, R. P.....	Hattiesburg.....	7	4
Branch Experiment Station.....	Holly Springs.....	4	26
Brantley, Dr. F. L.....	Walnut Grove, R. 3.....	1	15
Brewer, Mrs. C. B.....	Meridian.....	1	37
Brister, J. W.....	West Point.....	1	73
Brown & Majure.....	Decatur.....	20	6
Brown, C. E.....	Hattiesburg.....	1	17
Brown, J. E.....	Blue Mountain.....	8	1
Brunfield, J. M.....	Port Gibson.....		13
Burnley, J. M.....	Sallis.....		17
Burwell, S. L.....	Lexington.....	12	1
Byrne, M. O.....	Macon.....		16
Callicott, J. T.....	Cold Water.....		11
Calvet, J. V.....	West Point.....	5	3
Camp, H. A.....	Hattiesburg.....	1	6
Carter, W. B.....	West.....	3	19
Carter, W. E.....	Quitman.....	4	1
Castle, F. L.....	Sessums.....		39
Chandler, G. L.....	Meridian.....		16
Childre, M.....	Jackson, R. 4.....		16
Clarksdale Duroc Farms.....	Clarksdale.....	6	11
Cooper, R. A.....	Dixon.....	4	12
Cooper, Dr. T. E.....	Jackson.....	6	59
Cother Bros.....	Aberdeen.....		10
Cowsert, J. D.....	Goodman.....	4	15
Crosby, J. A.....	Kosciusko.....		24
Davidson, A. F.....	Walnut Grove.....	1	17
Dearing, R. J.....	Philadelphia.....	1	9
Deverbux Hall Asylum.....	Natchez.....	6	12
Dubard, E. A.....	Sallis.....	3	16
Ellington, D. J.....	Lexington, R. 5.....	4	28
Enochs, R. H.....	Fernwood.....	4	1
Fender, A. E.....	Wesson.....		17
Ford, J. F.....	Newton.....	18	43
Francis, W. G.....	Crystal Springs.....	9	3
Friene, Eugene.....	Brookhaven.....		25
Frizell, J. L.....	do.....	1	9
Gardner, F. M.....	Dixon.....	4	14
Garner, B. O.....	Pontotoc.....	5	37
Gavin, R. S.....	Columbus.....	17	3

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MISSISSIPPI—continued.			
Germany, B. R.	Philadelphia.	2	13
Gilbert, W. R.	Meridian.		22
Glenn Eden Stock Farm	Kilmichael.	5	12
Gober, J. L.	Kosciusko.	3	25
Gore, Mrs. J. H.	Water Valley.		13
Gousett, Geo.	Macon.		35
Gousett, Phillip.	do.		22
Guilledge, J. H.	Durant.	38	38
Hall, S. C.	Hattiesburg.	6	3
Hanson, H. H.	Macon.		24
Hardage, P. C.	Walnut Grove.	2	8
Harris, Mike.	Decatur.		15
Hawkins, W. L.	Clinton.	2	75
Headly, S. P.	Port Gibson.		16
Henderson, C. M., jr.	Sardis.	7	4
Henley, Albert.	Brooksville.		13
Herron & Ford.	Oakland.	5	29
Huckabie, J. C.	Laurel.		11
Hundley, W. H.	West Point.		20
Jefferie, Norman.	Jeffries.	30	
Jerrell, W. R.	Collins.	1	6
Jones, T. A.	Aberdeen.		26
Jones County Agriculture High School.	Ellisville.	2	20
Lewis, T. J.	Dixon.	2	6
Long, M. N.	Sebastopol.	8	14
Long, W. Fred.	Jackson.	3	18
McClland, C. H.	Durant.		12
McCuller, W. C.	Macon.		39
McCune, J. T.	Decatur.	2	6
McDonald, J. M.	Sebastopol.	1	4
McKellar, Cady I., & W. S.	Meridian.		14
McLeod, Wm. M.	Brooksville.	10	17
McMillan, A. L.	Louisville.	6	26
McMillan, Mrs. A. M.	Dixon.	3	8
Majure, K. D.	do.	3	5
Majure, W. E.	do.	2	4
Malone, H. G.	Greenwood.	1	4
Milan, H. T., & Co.	Myrtle, R. 1.	6	15
Mitchell, W. T.	Sanford.	3	5
Montgomery, T. M.	Starkville.	2	67
Moore, Jas.	Meridian.	8	
Moore, J. R.	do.	6	
Morgan, J. C.	Macon.	1	19
Morgan, W. P.	Sallas.	1	20
Norman, Berry.	West Point.		22
Oaklawn Dairy Farm.	Charleston.	3	27
Ogletree, Mrs. Nora.	Dixon.	2	4
Ogletree, R. D.	Dixon, R. 2.	6	16
Oliver, Rubie.	Duck Hill.	1	34
Owens, T. J.	Sallas.		22
Parkinson, R. N.	Durant.		16
Pate, G. E.	Woodland.		10
Peteech, Arch.	Greenwood.	1	29
Pierce, J. R. C.	Dixon.	2	14
Pilgram, G. A.	Complete.		17
Pope, G. J.	Collins.	3	2
Pope, O. C.	do.		11
Prichett, S. T.	Hattiesburg.		16
Prince, J. A.	New Albany.	1	13
Ratliff, Z. E.	West, R. 1.	1	19
Ray, B. G.	Pontotoc.	3	4
Rhea, E. F.	Lexington.	3	24
Richardson, W. J.	Macon.	1	20
Robinson, J. T.	Aberdeen.		12
Rogers, J. B.	Water Valley.	2	12
Rogers, Murray.	Macon.	5	20
Rogers, W. A.	Brookhaven.	31	
Rogers, W. V.	Macon.		63
Ryan, Thos. J.	Jackson.	14	1
Sanders, I. A.	Louisville.		18
Sayle, Lucie E.	Oakland.		15
Scott, R. A.	Senatobia.	5	
Seavy, C. E.	Aberdeen.		17
Simpson, H. H.	Winona.	3	13
Sissell, J. R.	Water Valley.	1	36
Sloan, H. C.	Wallerville.	5	2
Smith, A. S.	Decatur.		18

Tuberculosis Eradication under the Accredited-Herd Plan. 77

JERSEY—Continued.

Name.	Address.	Cattle once tested with out reactors.	
		Purebred.	Grade.
MISSISSIPPI—continued.			
Smith, C. H.	Meridian.		28
Smith, T. A.	Macon.	31	
Smythe, Mrs. D.	Kosciusko.		17
Stevens, J. M.	Grenada.	2	10
Stone, Jas., sr.	Oxford.	64	
Swan, J. D.	Purvis.		14
Sykes, C. E.	Duck Hill.	7	22
Tate County Agriculture High School.	Senatobia.		15
Thrash, W. Y.	Walnut Grove.	1	39
Todd, J. A.	Collins.		11
Todd, E. M.	Crystal Springs.	24	
Trussell, T. E.	Grenada.		10
Turner, W. L.	Philadelphia.	8	3
Vardaman, W. S.	Greenwood.		29
Ward, Evon C.	Kosciusko.		10
Watkins Bros.	Macon.	1	68
Watkins, H. A.	Dixon.	1	24
Watkins, J. R.	do.	7	13
Watkins, W. D.	do.	7	
Watkins, W. E.	do.	2	7
Weeks, A. S.	West.	7	
Weens, S. W.	Lexington.	9	26
Wigley, D. C.	West.	1	27
Wigley, J. F.	do.	1	23
Wigley, T. E.	do.	2	25
Wilbanks, J. E.	New Albany.	2	17
Wilkins, J. D.	Duck Hill.	1	33
Williams Bros.	Philadelphia.	2	7
Williamson, E. W.	Purvis.		10
Willis, Vander.	Dixon.	2	8
Wilson, J. W.	Philadelphia.	6	6
Wingfield, J. R.	Dixon.	1	9
Young, G. W.	Lumberton.		20
MISSOURI.			
Anderson, Ben R.	Perry.	5	25
Atteberry, Fern.	Elkland.		20
Atteberry, John V.	do.		10
Barnes, S. K.	Marshfield.		11
Beckner, A. L.	do.	4	40
Berry, Ralph.	Carthage.	19	12
Biles, C. E.	Safe.	2	10
Black, K. K.	Fordland.	1	11
Bluhm, Thomas A.	Smithton.		10
Bolte, John.	do.	2	20
Bouldin, H. R.	Hughesville.	8	19
Brand, H. A.	Cape Girardeau.	2	12
Brixey, R. C.	Marshfield.		10
Brixey, Barney.	do.	7	25
Brock, Tom, & Son.	Reeds.	11	11
Browsers Bros.	Willard.	8	24
Brown, George Warren.	Crescent.	6	2
Buckley, T. A.	Sedalia.	8	7
Buffum, J. A.	Columbia.	17	
Bumgarner, C. C.	Elkland.	1	19
Burrows, J. S., & Sons.	Carthage.	20	3
Busiek & Schuttler.	Farmington.	8	25
Camfield, W. G., & Sons.	Neosho.	21	5
Campbell Bros.	Carthage.	5	
Clark, E. T., & Son.	Monroe City.	60	
Clary, Thomas C.	Joplin.	1	19
Clouse, A. G.	Marshfield.		11
Coffelt, E. C.	Strafford.	10	13
Coffman, C. A.	Marshfield.		11
Coleman Farm.	Coleman.	17	1
Corder, Charles C.	Carthage.	6	13
Crawford, T. D.	Nevada.	5	2
Curran Bros.	Sedalia.	1	16
Davis, C. B.	Elkland.	2	12
Demand, Elsten.	Smithton.	6	11
Dennis, C. B.	Trenton.	4	34
Dillard, J. G.	Jefferson City.		26
Drum, O. C.	Jackson.	6	35
Durnell, Fred.	Springfield.	30	20
Ehlers, Chris.	Cape Girardeau.	1	11
Ennis, Albert S.	Festus.	21	13
Fellin, P. J.	Marshfield.		15

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MISSOURI—continued.			
Fellin, Louis.....	Marshfield.....		13
Fellin, Jim, & Ed.....	do.....		22
Felske, Jacob.....	Carthage.....	4	53
Forbis, M. F.....	Chillicothe.....	9	21
Ford, N. D., & Son.....	Jackson.....		21
Ford, R. H.....	do.....		12
Forderhase, George R.....	Hermann.....		13
Fornkohl, Wm.....	Cape Girardeau.....	1	13
Foster, C. A.....	Trenton.....	44	
Froemsdorf, H. J.....	Cape Girardeau.....	4	12
Glanbitz, B.....	Rogersville.....	10	7
Glanbitz, Emanuel.....	Fordland.....		12
Goodfaster, J. T.....	do.....		12
Guy, L. P.....	Marshfield.....		10
Hagan, George W.....	Lees Summit.....	10	4
Harlan, O. O.....	Marionville.....	16	14
Harris, Lee.....	Carthage.....	20	13
Hart, Edgar.....	Urich.....	8	2
Hartman, Wm.....	Marshfield.....	3	12
Hartshorn, Mrs. Dave E.....	Farmington.....		12
Hawn, J. F.....	Cape Girardeau.....	2	15
Head, S. R.....	Hannibal.....	27	
Hitt, Horace E.....	Gordonville.....	1	23
Hitt, M. L.....	do.....		17
Hobbs, John A.....	Jackson.....	2	30
Hoehns, W. A.....	Smithton.....		13
Hollis, J. M.....	Elkland.....		11
Huber, Gilbert B.....	Perryville.....	6	14
Hume, H. H.....	Urbana.....		13
Hunsaker, T. H.....	Novelty.....	1	17
Independent Order of Odd Fellows Home.....	Liberty.....	53	5
Jackson, R. A.....	Huntsville.....	23	2
Johnson, Roy.....	Farmington.....		15
Keller, A. O.....	Cape Girardeau.....	3	29
Keller, F. A.....	do.....		15
Keller, H. M.....	do.....	7	13
Kellogg Farm.....	Carthage.....	4	33
Klein, August.....	Sedalia.....	8	5
Knight, A. G.....	Trenton.....	6	5
Landers, O. S.....	Dadenville.....		14
Leuther, F. C.....	Marshfield.....	8	3
Lewis, E. R.....	Jackson.....	5	41
Lewis, T. H.....	Cape Girardeau.....	8	7
Lochrie, George M.....	Carl Junction.....	17	2
Long, John.....	do.....	9	1
Lujin, Roy.....	Smithton.....		11
McCall, Dan.....	Elkland.....	12	
McGary, G. R.....	Fayette.....	2	22
McKinney, J. G.....	Marshfield.....	2	12
McWilliams, Dr. J. A.....	Bucklin.....	20	1
McWilliams, J. N.....	do.....	23	
Mammon, Charles.....	Cape Girardeau.....	1	12
Mayhew, D. S.....	Monett.....	26	22
Monsees, J. T.....	Smithton.....	1	16
Monsees, W. C.....	Sedalia.....	27	14
Morris, D. R.....	Bucklin.....	21	2
Morris, H. J.....	New Cambria.....	26	
Morton, W. P.....	Jackson.....	6	10
Motley, L. W., & Sons.....	Vandalia.....	6	8
Nichols, Herschel.....	Huntsville.....	17	
Nordike, S. A., & Son.....	Springfield.....	4	30
North, Dick.....	Neosho.....		26
Norton, N. L.....	Sedalia.....		13
Oliver, Rolla.....	Independence.....	46	1
Osredker, A.....	Marshfield.....		11
Paugh, E. F.....	Carthage.....	21	9
Peabody, C. F., & Son.....	Smithton.....		10
Phelps, Julius C.....	Jefferson City.....		11
Pile, Seldon H.....	Glasgow.....	1	25
Poundstone, R. F.....	Oronogo.....	22	1
Ragsdale, J. M.....	Marshfield.....	1	20
Rainwater, J. M.....	Kirksville.....	13	
Reed, Clarence E.....	Puxico.....	9	2
Redmon & Son.....	Tipton.....	54	
Reesman, A. J.....	Kirksville.....		17
Robinson, C. A.....	do.....	59	4

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
MISSOURI—continued.			
Roller, S. M.	Purdy	16	18
Roney, T. J.	Webb City	19	31
Rose, Guy M.	Rogersville		14
Ross, Frank F.	Carl Junction	13	2
Ross, W. B.	Cape Girardeau		10
Rowland, H.	New Cambria	22	
Saffarans, George V.	Palmryia	30	
Sandry, W. J.	Novinger	31	2
Schulze, H. H.	Fordland		21
Seimers, A. H.	Cape Girardeau	1	17
Shertz, W. W.	Fordland	12	2
Slater, F. E.	Hale	14	23
Smith, Ira L.	Smithton		12
Smith, N. A.	do.		11
Snodgrass, D. R.	Elkland		14
Snodgrass, J. M.	do.		13
Snyder, James R.	Frazer	17	4
Spink, Mrs. Ella	Marshfield		12
Stevenson, W. H.	Savannah	8	1
Stuckey, Edward	Carl Junction	7	9
Thompson, James E.	Marshfield	13	8
Tisdale, G. W.	Gordonville	1	17
Truitt, Mrs. Mary E.	Columbia	11	
Von Gremp, C. C.	St. Charles	11	11
Walbridge, C. M.	Kansas City	15	
Walker, J. T. Est.	Clarksville		48
Wallen, Ernest W., & Son.	Monett	16	
Wampler, Clyde	Amazonia	10	7
Wampler, L. M.	do.	27	
Watkins, Walter R.	Clayton	8	14
Watts, C. N.	Rogersville		16
Webb, J. A.	Oak Grove	3	12
Webster, C. D.	St. Joseph	7	5
White, J. R., & Son	Aurora	3	25
Whiteside, Tom	Springfield	15	
Whittenburg Bros.	Marshfield	12	15
Wise, Edward L.	Webb City	6	
Wrigley, R. G.	Savannah	39	1
Young, R. I.	St. Joseph	8	
Zigelhofer, George	Marshfield	10	18
MONTANA.			
Burgess, S. J.	Helena		91
Daniels, R. H.	Corvallis	8	4
Kelly, Samuel	Cascade		60
Logan, Mrs. Toi Long	Stevensville	25	8
McComas, W. P.	Helena		46
Myers, S. C.	Huntley	1	33
Smith, W. A.	Simms	2	21
Smock, E. A.	Cascade		25
Thurston, Charles	Butte		51
NEBRASKA.			
Barnell, Sumner	Sutton	13	
Carothers, A.	Beaver City	14	
Eager, Earl	Beaver Crossing	24	
Englehardt, G. W.	Osceola	5	4
Glass, Albert	Fairfield	1	16
Margrave, J.	Preston	4	10
Miller, Frank	Clay Center	7	
Nevins, E. L.	Fairfield	12	
Norlin, John	Harvard		10
Ransom & Smelz	Clay Center		27
Ransom, Schuyler	Salem	1	17
Rice, Wm. G.	Fort Crook	10	4
Savin, R. T.	Lexington	6	13
Sinclair, N.	Collegeview	1	11
Stewart, W. Y.	Ord	6	9
Theer, Rena	Shickley	5	7
Weller, W. F.	Raymond	1	26
Williams, W. J.	Cedar Rapids	16	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NEVADA.			
Cooper, Richard	Overton	1	13
Filbey, J. L.	Las Vegas, box 104		24
Farmer, J. R.	Sparks, box 263		33
Gibson, Robert O.	St. Thomas		10
Glazier, Chas. E.	Fallon		29
Johnston, J. H.	do		39
Mathews, Frank, Estate	Yerington		23
McCain, A. A.	Kaolin		10
NEW HAMPSHIRE.			
Bass, Robert P.	Peterboro	14	20
Garvin, F. E.	Concord	3	8
Hunter, Roy D.	West Claremont	36	9
Lovejoy, Harry C.	Cornish Flat		19
Mativia, H. J.	Lyme	19	
Putnam, Geo. M.	Contoocook	33	1
Putney, Ira A.	Hopkinton	3	14
Record, W. J.	Hanover	4	58
Rossiter, C. T.	Claremont	11	16
Stearns, N. F.	Lebanon	15	21
Townsend, H. S.	do	20	11
Walton, Fred.	East Derry	7	
NEW JERSEY.			
Doscher, Charles A.	Millington	38	
NEW YORK.			
Babcock, C. H.	Friedrship	49	
Christian, Howard	Ashland		13
Clark, M. H. & M. A.	Elma	33	
Devine, Dr. J. F.	Goshen	9	1
De Witt, Owen	Interlaken	24	
Genung, Dr. H.	Freeville	20	
Gregory, D. M.	Mount Vision	10	11
Hoose, Arthur L.	do		15
Hosford, J. S.	Kinderhook	60	
Ingalshe, Frank	South Hartwick	16	
Keeney, F. B.	Warsaw	49	
La Salle Jersey Stock Farm	La Salle	60	
Mills, Ogden	Staatsburg	53	
Parks, C. J.	Fergusonville	1	14
Relyea, A. J.	Oneonta	6	
Rounds, John	Mount Vision	2	12
Smith, H. C. & A. V.	Marcellus	37	
Steele, P. R.	Windham	3	24
Wardwell, H. L.	Springfield Center	11	8
Wilbur, D. G. & E. R.	Stillwater	7	10
Young, Dr. D. F.	Phoenix	43	
NORTH CAROLINA.			
Abernathy, C. L.	Charlotte	1	24
Ackemran, S. A.	do		16
North Carolina State College of Agriculture and Engineering.	Raleigh	56	11
Alexander, J. L.	Gastonia		10
Alexander, J. W.	Kannapolis		12
Allen, O. R.	Mocksville	1	20
Anders, J. E.	Asheville, R. 5		19
Anthony, W. D.	Gastonia		15
Arrowood, L. C.	Bessemer City	2	21
Atwood, A. B.	Winston-Salem, R. 1	11	49
Austin, J. W.	Biltmore		32
Baker, W. F.	Charlotte	5	33
Ballard, L. G.	Candler, R. 2		13
Barger, T. J. A.	Salisbury, R. 6	4	4
Beaty, T. J.	Paw Creek		17
Bernhardt, R. L.	Salisbury		11
Black, J. A.	Charlotte		11
Bodenhamer, O. H.	Winston-Salem, R. 5	1	17
Booker, L. S.	Durham		21
Bost, C. M.	Matthews	4	7
Bost, J.	Rockwell		10
Boyd, W. R.	Charlotte	2	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH CAROLINA—continued.			
Boyd, T. C.	Charlotte, R. 9.		12
Bradley, Mrs. W.	Statesville.		12
Briggs, O. W.	Fletcher.		11
Brown, Jas. S.	Asheville, R. 2.		10
Brown, W. A.	Rocky Point.		17
Bullard, James	Fayetteville.		12
Burrage, R. L.	Concord.	1	23
Cansler, E. T.	Charlotte.	21	
Carriber, J. E.	China Grove.		16
Coble, S. E., Friendship Farm.	Guilford College.		22
Compler, Ben.	Goldsboro.		11
Coner, W. C.	Cherryville.		12
Conley, T. E.	Salisbury.	2	14
Craig, W. R.	Mocksville, R. 4.		12
Creasman, C. M.	Biltmore.		12
Davall, W. H.	Asheville, R. 4.		16
Davis, B. G.	Bessemer City.		15
Davis, L. L.	Kinston.		11
Deal, C. C.	China Grove.		13
Deal, E. L.	do.	2	6
Dellinger, E. Lee.	Cherryville.		14
Dennis, W. J.	West Durham.		16
Dillingham, A. M.	Asheville, R. 2.		16
Dixon, C. S.	Raleigh.		18
Dockery, J. C.	Asheville, R. 1.		13
Dykers, M.	Wilmington.		13
Eakers, C. M.	Crouse.		11
Edmiston, V. C.	Mount Ulla.		12
Endsley, W. H.	Winston-Salem.		10
Falls, R. M.	Gastonia.	1	9
Finger, C. E.	Hickory.	25	
Flowe, J. W.	Kannapolis.		
Foard, J. D.	Statesville.	8	45
Foil, H. C.	Rockwell.		15
Fuwalon, G. W.	Biltmore.		23
Gaddy, W. H.	do.		36
Galloway, M. A.	Charlotte.		17
Gate, F. T., & Son.	Hoffman.	11	18
German, J. E.	Boomer.	16	7
German, J. M.	do.	6	10
Gillispie, W. K.	Asheville.		29
Gochnauer, C. H.	New Bern.		10
Green, A. C.	Raleigh.		13
Green, J. E.	do.	1	8
Green, T. M.	Fayetteville.	1	30
Green, N. W.	Raleigh.		23
Greenwood & Sams.	Asheville.		49
Greer, Grover C.	Grassy Creek.	16	18
Griffin, B. F.	Matthews.	2	6
Harden, John W.	Raleigh.		26
Harris, N. B., & Bros.	Newell.	7	12
Heavner, F. J.	Lincolnton, R. 1.	2	6
Henderson, E. L.	Graham.		12
Herman, P. G.	Conover, R. 1.	10	1
Hoover, G. L.	Charlotte.		16
Hunsucker, G. L.	Asheville R. 1.		10
Irvin, T. S.	Mocksville.		15
Jackson, F. H.	Bowling Green R. 1.		11
Jackson, R. A.	do.		19
Jeffreys, J. M.	Raleigh.	5	6
Johnston, I. W.	Wilmington.		13
Jones, T. P.	Candler.		15
Justice, C. N.	Rutherfordton, R. 4.	4	8
Justus, W. S.	Biltmore.		37
Kilgore, B. W.	Raleigh.		27
Kindley, G. W.	Greensboro.		22
Kiser, D. A.	Bessemer City, R. 2.		12
Knowles, H. C.	Wilmington.		10
Lambeth, J. W.	Thomasville.	1	25
Lawrence Bros.	Raleigh.		11
Lee, W. R.	Charlotte, R. 2.	7	6
Ledbetter, Carrol.	Asheville.		16
Legans, G. L.	Cana.		13
Lewis, J. A.	Greensboro, R. 2.	1	22
Lineberry, C. C.	Greensboro.		1
Lingerfelt, W. M.	Bessemer City.		11

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH CAROLINA—continued.			
Ludwick, T. B. S.	Salisbury		22
Lumberton Cotton Mills	Lumberton	1	37
Lunsford, H. M.	Asheville, R. 3.		21
Lutz, Miss Sarah C.	Newton	6	
Luwalon, G. W.	Biltmore		21
McDaniel, J. F.	Kinston		17
McDowell, R. E.	Charlotte	6	14
McKennon, L. W.	Maxton	19	
McLaughlin, H. L.	Mount Ulla	1	6
McLean, S. B.	Maxton	14	
McNight, J. F.	China Grove	1	17
Martin Farms (Inc.)	Belmont, R. 1.	22	
Mason, P. R.	Thomasville	2	11
Menius N. W.	Salisbury	1	11
Methodist Orphanage	Raleigh		21
Misenheimer, J. A.	Rockwell		10
Moore, A. E.	Gastonia		20
Morris, Dr. J. A.	Oxford	1	7
Morrison, W. E.	Statesville	4	19
Morrow, T.	Mount Ulla	14	
Moose, E. L.	Conover	7	2
Moss, J. R.	Albemarle	7	2
Mouser, H. E.	Newton	5	4
Nazareth Orphanage	Raleigh		11
Neel, D. L.	Woodleaf		23
Nettles, H. L.	Biltmore		56
Oats, T. R. E.	Gastonia		12
Orr, R. W.	Statesville		14
Osborne, F. C.	Fletcher, R. 1.		10
Paine, I. N.	Statesville		13
Parker, R. A.	Weaverville		11
Pearson, B. G.	Gastonia		10
Pearson, W. C.	do.		21
Pember, E. A.	New Bern		15
Penninger, M. L.	Mount Pleasant, R. 3.		14
Phipps, J. Henry	Greensboro		14
Piedmont Experiment Station	Statesville	2	4
Pitts, J. P.	Hickory	2	3
Price, S. I.	Charlotte		23
Pugh, A. W.	Climax	11	15
Rea, J. L.	Matthews		23
Reams, E. L.	Charlotte		13
Redman, G. R.	Biltmore		22
Reynolda Farms Co.	Winston-Salem	66	
Rhyme, E. C.	Reepsville		11
Ricks, R. H.	Rocky Mount		42
Roberson, W. M.	Asheville, R. 1.		12
Roberts, J. M.	Asheville		15
Robinson, J. C.	Gastonia		27
Robinson, J. H.	Charlotte, R. 7.	2	31
Roper Lumber Co.	Roper		10
Rouse, N. J.	Kinston		12
Rowe, Mary	Conover	2	8
Royster, T. S.	Bessemer City		11
Sharp, W. H.	Greensboro		19
Sherrill, M. F.	Statesville		10
Shuford, R. L.	Salisbury	3	5
Shuping, W. A.	Salisbury, R. 5.	3	3
Smith, G. D.	Biltmore		24
Smith, J. F.	Concord	1	24
Smith, J. G.	Guilford College		15
Sparrow, Thos.	Gastonia	12	14
Stevenson, J. H.	New Bern		17
Stewart, C. B.	Derita, R. 14.		16
Stewart, J. A.	Mooresville	3	5
Stirewalt, G. C.	China Grove	4	6
Turner, J. F.	Mount Ulla		12
Turner, W. P. M.	Wilmington	2	13
Wagoner, F. A.	Mocksville		14
Wake County Home	Raleigh		13
Ward Bros.	Greensboro		12
Warlick, J. R.	Reepsville	2	9
Warlick, T. A.	do.		12
Waugh, Mrs. James	Greensboro		17
Weathers, T. P.	Raleigh		19
Weijers, Christiaan	Wilmington		12
Wheeler, Paul	Durham		21

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
NORTH CAROLINA—continued.			
Whitesides, M. W.	Kings Mountain		11
Wiggs, W. B.	Goldsboro		10
Williams, H. B.	Raleigh, R. 2	5	19
Wilson, R. H.	Gastonia, R. 3		13
Wilson, W. A.	Asheville		13
Woods, J. L.	Durham, R. 3		18
Yost, R. W.	Charlotte	2	16
NORTH DAKOTA.			
Albright, M. H.	Fargo		13
Hammond, C. B.	Clyde	6	6
Lund, H.	Carrington		12
Newgard, E.	Cummings	14	
Noble, M. B.	Hillsboro	7	9
School for Blind	Bathgate		5
Tuberculosis Sanitarium	Dunseith	1	26
Page, Wm., & Sons	Hamilton	16	2
Smith, W. S.	Kenmare	2	13
OHIO.			
Abbott, George F.	Chippewa Lake	27	
Andre, Leroy W.	Hanoverton	6	
Arbaugh & Miser	Salem	15	
Ault Sisters	Barnesville	2	15
Bachman, H. C.	Canal Winchester	13	2
Bachman, S. L.	do.	16	1
Barkley, Ellis B.	Oxford	12	
Bartles, H. S.	New Philadelphia	10	
Beardsley, H. J.	Canfield	33	4
Bee, Walter	Bethel	12	
Belmont County Children's Home.	Tacoma		10
Benner, Jerome L.	Tiffin		12
Binns, John A.	Salem	13	
Blosser, Eli.	North Lima	3	15
Boltz, A. H.	New Philadelphia	15	
Bowles, A. B.	Harrison	10	1
Brady, W. G.	Barnesville	3	11
Brisker, Eli.	Salem	20	
Brockett, E. W.	Atwater	18	
Brooks & Barker	Salem	32	
Brown, M. E.	Columbus		18
Bruderly, Fred	Washingtonville	19	4
Bundy, W. J.	Colerain	2	3
Burchfield, George C.	Barnesville	1	12
Candel, Henry	Columbiana	18	
Campbell, C. H.	St. Clairsville	18	
Chidsey, Grant C.	Brunswick	22	
Christy, S. G.	St. Clairsville		11
Coning, D. M.	Dayton		13
Conkle, Alonzo	Clark	17	
Conkle, C.	Layland	44	
Cope, Emmor	Salem	10	1
Crawford, Thomas	do.	11	
Crouse, Rollin	North Lima	5	
Croy, N. S.	Pomeroy		23
Cuckler, W. H.	Athens	13	4
Damon & Co., C. W.	Brunswick	25	
Delaney, G. W.	Barnesville	11	1
Dempsey, Tom.	Waterville	15	
Denison & Son, L. L.	Delaware	23	
Denlinger, Moses	Trotwood		18
Detrow, Sylvanus	Poland	6	
Dickey, Mrs. Dell	Elkton	6	2
Doudna, J. E.	Quaker City	18	4
Drewsey, Mrs. L. D.	Terrace Park	13	
Dumford, J. W.	Pleasant Plain	13	
Dunn, Walter	Salem	16	11
Dysart, W. H.	Pataskala		16
Ehlin, James	Middleport		23
Emery, D. C.	Napoleon	4	14
Farrell, Herbert	Sandusky	5	
Filbrun, F. A.	Dayton		10
Fitz, John	Venice		18
Fraley, E. P.	Bellaire		12
Frederick, Allen	Poland	19	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
French, Homer.....	Salem.....	14	.....
Fultz, F. W.....	Hanoverton.....	7	.....
Galloway, J. C.....	Bridgeport.....	1	9
Garber, C. W.....	Bellville.....	7	9
Garman, H. B. & B. F.....	Everett.....	6	12
Garrison, W. W.....	Springfield.....	22	.....
Gebhard, John W.....	Elkton.....	.....	13
Geigher, F. B.....	New Springfield.....	7	3
George, H. G.....	Hiram.....	6	2
Giffce, J. B.....	Barnesville.....	28	1
Giffin, F. M.....	Bellaire.....	7	1
Giffin & Son, J. M.....	do.....	15	7
Gilmore, Waid A.....	Minersville.....	.....	26
Godfrey, O. L.....	Bridgeport.....	9	4
Gosser, Louis A.....	Berlin Center.....	5	4
Gracey, J. E.....	Quaker City.....	17	3
Graham, J. M.....	Millersburg.....	.....	7
Haines, J. R.....	Dillonvale.....	9	16
Haines & Cochran.....	Blanchester.....	35	.....
Hall, J. Wilmer.....	Barnesville.....	6	4
Hall, W. T.....	do.....	10	33
Halle, Salmon P.....	Wickliffe.....	9	5
Halverstadt, A. C.....	Columbiana.....	7	3
Hamilton, I. H.....	Toledo.....	4	3
Hamilton County Experiment Farm.....	Mount Healthy.....	1	12
Hanna, M. R.....	Elkton.....	13	.....
Haven, B. W.....	Galena.....	7	11
Heeter, Albert.....	New Lebanon.....	.....	13
Higgins & Son, J. W.....	Athens.....	4	25
Hippely, Fred.....	Salem.....	28	2
Hoopes, Charles.....	do.....	3	14
Irey, Julian.....	Lisbon.....	5	9
Jeffers, A. B.....	Barnesville.....	.....	13
Johnson, W. S.....	St. Clairsville.....	7	12
Jones, A. C.....	Yorkville.....	7	.....
Jones, Austin.....	Wilmington.....	15	1
Judkins, James A.....	Barnesville.....	.....	23
Kennedy, W. F.....	Blue Ash.....	12	.....
Kimberlin, E. F.....	Orrville.....	3	8
King, Harry J.....	Washington C. H.....	.....	16
Koerner, George A., & Son.....	Powhatan.....	54	1
Krieger, E. J.....	Swanton.....	3	2
Krieger, W. H.....	Bridgeport.....	.....	12
Kryder, Geo. E.....	McClure.....	21	.....
Lane, C. C.....	Bellefontaine.....	13	30
Leshner, Torrence.....	Vandalia.....	5	3
Lewis, B. S.....	St. Clairsville.....	.....	13
Long, Byron.....	Waynesburg.....	10	1
Long, J. P.....	Dayton.....	.....	12
Lucius, Mrs. W. I.....	Hamilton.....	10	.....
Lust, W. H.....	Marion.....	2	5
McCorkle, R. L.....	Niles.....	8	.....
McKittrick, B. A.....	West Mansfield.....	13	.....
Mahmsbury, J. S.....	North Benton.....	16	.....
Maple Grove Dairy.....	Smithville.....	41	5
Martin, S. E.....	New Concord.....	30	.....
Martindill, J. E.....	Pataskala.....	.....	13
Mercer, L. L.....	St. Clairsville.....	11	4
Meyer & Sons, C. F.....	New Philadelphia.....	21	8
Miley, D. C.....	Layland.....	4	9
Miller & Son, E. F.....	Vermilion.....	9	2
Miller & Son, H. P.....	Sunbury.....	27	41
Miller & Son, Wm.....	Gypsum.....	9	4
Moore, J. E.....	Hanoverton.....	27	.....
Moore, John H.....	Pataskala.....	3	10
Mowen & Moore.....	Deerfield.....	19	4
Murphy, J. A.....	Bethesda.....	16	19
Nash, Dr. J. K.....	Youngstown.....	8	.....
Neer & Son, J. S.....	Mechanicsburg.....	34	.....
Negus, A. J.....	Bridgeport.....	25	8
Newhouse, J. B.....	Magnolia.....	7	.....
Niekols, A. J.....	Berlin Heights.....	18	3
Nuhfer, George.....	Woodville.....	21	.....
Parrish, E. C.....	Cadiz.....	2	4
Perry County Infirmary.....	Lexington.....	.....	14
Phillips, C. M.....	Barnesville.....	9	.....
Phillips, Ross.....	do.....	7	.....

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OHIO—continued.			
Pike, G. W.	New Waterford	11	4
Pim, F. C.	East Rochester	3	6
Pim, J. G.	Beloit	23	
Plumly, Park	Barnesville	4	7
Pomerene, W. R.	Worthington	8	
Pow, C. A.	Salem	8	12
Price, W. H.	Woodville	14	
Pyle, S. C.	Clarksville	1	4
Ransom, Ben.	Prospect	9	9
Reed, G. C. & H. C.	Canfield	13	6
Renninger, P. L.	Clifton	9	
Riley, John L.	Canfield	10	
Rinehart, R. R.	Magnolia	17	
Ritchey, E. T.	Tuppers Plains	16	
Robinson Bros.	Plair City	58	
Robinson, E. C.	Copley	13	4
Robinson, J. T.	Marysville	26	2
Rogers, Roscoe M.	Rogers	21	
Rohrer, J. S.	North Lima	14	3
Rohrer, S. E.	do.	11	3
Rose, M. T.	Greenfield	3	13
Ross, C. W.	Felicity	13	
Rossolot, Charles	Pleasant Plain	28	4
Roth, Lewis	Bridgeport	11	
Rupert & Son, Benj.	New Waterford	32	
Sale, Walter W.	Columbus	8	
Schumacher, Menno	Pandora		13
Scott, Seth P.	Lisbon	18	
Sears, W. H.	Barnesville	5	
Shaw, J. T.	Lisbon	9	3
Short, J. C.	Xenia	18	
Shrock, A. J.	North Lima	15	
Slagel, Homer B.	Poland	23	
Smith, F. B.	Cadiz	11	4
Smith, H. C.	Salem	2	3
Stamp, J. R.	do.	7	2
Stamp, J. W.	do.	16	
Steer, L. E.	Hanoverton	6	1
Steiner, William	Pandora		11
Stewart, C. V.	Amalin		11
Stillson Bros.	Kent	6	
Stockslager, Chas.	Lewisburg	25	
Stouffer, H. S.	Continental	18	1
Stratford, Thos. G.	Canfield	11	5
Stratton, B. W.	Hanoverton	19	1
Telling-Belle Vernon Co.	Willoughby	19	47
Terrell, Harley	Degraff		14
Thomas, Walter S.	Adena	11	
Tyson, Charles	Hamilton	31	
Van Blaricom, S. N.	Salem	13	
Venable & Son, J. W.	do.	24	
Vickers, F. R.	do.	26	
Walker, H. F.	Williamsburg	20	
Walker, R. L.	Bridgeport	8	9
Walton, D. E.	Columbiana	9	
Ware, W. L.	Batavia	6	
Whinnery, O. E.	Salem	10	
White, L. A.	Clyde	6	1
Wright, Rev. E. J.	Granville		13
Zedaker, J. C.	Youngstown	3	5
Ziegler, Alvin E.	Sterling, R. I.	2	3
OKLAHOMA.			
Agricultural and Mechanical College	Stillwater	18	
Bell, Robert	El Reno	18	3
Bush, A. B.	Comanche	9	3
Butler, A. M.	Guthrie		16
Hampton, L. A.	Dale	11	10
Harrison, H. E.	El Reno	10	20
Harris & Patterson	Muskogee	71	16
Hawley, William	Guthrie		15
Madden, Fred	do.		19
Mecoskey, John	El Reno		11
Murray State School	Tishomingo	6	
Oklahoma Institute for Feeble Minded	Enid	1	64
Schalke, Henry	Guthrie		22

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
OKLAHOMA—continued.			
Sheffler, E. E.	Guthrie	1	29
Stochr, C.	El Reno		13
State Reform School	Pauls Valley	1	84
Thompson & Boone	Guthrie		
Wolfe, Frank	El Reno	18	5
Worthington, John	do.	6	9
OREGON.			
Abraham, V. S.	Gaston	15	19
Allen, D. P.	Blind Slough		19
Bagley Co.	Hillsboro	12	
Baslington, George W.	Astoria		21
Bixby, B. A.	Freewater	11	10
Black, Noah	Reedsport		32
Butler, F. E.	Blind Slough		17
Chandler, A. B.	Sheridan	8	
Cleveland, W. H.	Gresham	13	
Conkey, C. H., & Frank Alderman	La Grande	12	
Dammeier, G. H.	Gresham	10	
Ehsen, Chris.	Astoria		23
Elligsen, Z.	Oregon City	16	
Exon, J. W.	Woodburn	20	
Fox Bros.	Silverton	21	
Hart, E. D.	Boring		11
Ierger, A. H.	do.		14
Jones, Jacob W.	Roseburg		34
Kalander, Emil	Blind Slough		17
Kangas, Jan.	do.		10
Kemmling, John	Prineville		29
Lahti, Henry	Blind Slough		13
Landes, M. E.	Redmond		15
McCalman, A.	Scotts Mills	19	
McCoy, J. D.	Freewater	23	
McCully, C. B.	Aumsville	14	
Malar, A., jr.	Boring		18
Marks Bros.	Roseburg	14	25
Martin, William	Forest Grove	28	
Michelson, Elias	Blind Slough		10
Michelson, Victor	do.		10
Morrow, W. O.	Independence	5	
Nelson, Be.	Boring		12
Oja, Abel	Blind Slough		10
Polso, John	do.		15
Reid, Clifford	Portland	10	
Schultz, John	Blind Slough		16
Sneed, N. T.	Halsey	12	
Walker, W. L.	Joseph		13
West, Harry	Scappoose	35	
Wilson, Hugh	Joseph	35	
Winter, Chris.	Astoria		11
Wood, Sam M.	Redmond	21	
PENNSYLVANIA.			
Arnold, Raymond B.	Milan	6	43
Ball Brothers	Birchardville	24	2
Barber, H. S., & Son	Mercer, R. 4	30	2
Berryhill, C. M.	Hickory	27	
Bixler, E. S.	Easton	7	
Boak, J. A.	New Castle, R. 4	19	2
Boozell, Harry	Volant, R. 2		18
Bortz, D. R., & Son	Greenville, R. 49		10
Brenneman, Gideon J.	Elk Lick		25
Bronson, J. W.	New Galilee, R. 1	12	
Buchanan, J. E.	West Alexander	7	1
Buckwalter, Mrs., & Son	Pulaski, R. 62, Emerald Crest Farm	8	16
Byers, J. F.	Enon Valley, R. 2	1	17
Cameron, A. F., & J. O.	New Castle, R. 4	21	
Chamberlin, T. J.	Munderi	2	10
Clark, Rufus W., & Son	Enon Valley, R. 1	2	28
Cox, John W.	New Wilmington	15	4
Cox, Pearson	New Wilmington, R. 63	11	2
Craig, J. G.	West Alexander	10	9
Craig, N. A.	Edinburg, R. 2	1	11
Crandall, Philip S.	Alba, R. 3		22
Davison, H. M.	Tarentum, R. 3	35	
Davis, Lawrence	Mercer, R. 6	10	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
PENNSYLVANIA—continued.			
Davidson, Frank.....	Townville.....	8	1
Devlin, Thomas.....	Langhorne, Cedarlin Farm.....	15	16
Dick, Robert W.....	Pulaski.....	4	17
Douglas, R. R.....	Enon Valley, R. 1.....	1	26
Fullerton, W. S.....	Edinburg, R. 2.....	14	
Gazzo, Frank.....	Mercer, R. 3.....		11
George Junior Republic.....	Grove City.....		12
Gilkey, J. F., & Son.....	Pulaski, R. 62, Homestead Farm.....	2	16
Gilson, H. J.....	Titusville, R. 2.....		17
Gladfelter, W. L.....	Spring Grove, Old Forge Farm.....	59	
Graham, J. C.....	Mercer.....		13
Grove, Clyde.....	Diamond, R. 1.....		12
Hackney, E. S.....	Uniontown.....	12	
Hall, Mrs. J. K. P.....	Ridgway.....		10
Hoopes, Albert W.....	West Chester, Highland Farm.....	75	31
Hope, W. H.....	Enon Valley.....	1	14
Hummer, E. W.....	Titusville, R. 2, Mapleside Farm.....	10	33
Hunt, J. M.....	New Castle, R. 4.....	7	11
Hunt, S. J.....	do.....	3	18
Ingraham, O. R.....	Townville.....	14	
Jamison, T. A.....	Jackson Center.....	3	12
Jenkins, Charles S.....	Landsdale.....	25	4
McCastin & Forbes.....	New Castle, R. 6.....	33	
McClelland, E. C.....	Edinburg, R. 2.....	14	16
McClelland, H. A.....	Edinburg.....		12
McCurdy, R. L.....	Portersville, R. 3.....		10
McDougall, G. M.....	Mercer, R. 2.....		24
McEwen, F. E.....	do.....	6	9
McFarland, E. E.....	Pulaski, R. 62.....		15
Mack, J. B.....	Titusville, R. 5.....	1	22
Main, J. M., & Sons.....	Shippensburg, R. 3.....	19	
Meals, F. H.....	Saegertown.....	9	
Montgomery, T. N. & R. E.....	Grove City, R. 16, Cloverhill Farm.....	1	20
Needler, C. W.....	Edinburg.....	2	11
Oliver, John C.....	Sewickley.....	6	4
Reed, James P.....	West Alexander, R. 3.....	15	7
Ribb, F. O., & Son.....	Diamond, R. 1.....		15
Root, James.....	Titusville, star route.....		10
Shields, Frank.....	Portersville, R. 2.....	5	
Shoemaker, J. C.....	Enon Valley, R. 2, Hill Crest Stock Farm.....	1	11
Sibley, Jos. C.....	Franklin, River Ridge Farm.....	33	
Snyder, H. S.....	Bethlehem.....	19	
Swisher, J. Jay.....	Enon Valley.....	1	13
Syling, J. B.....	Elwood City, R. 1.....	2	10
Tittsler, W. C.....	Pulaski, R. 62.....	19	1
Vansant, Dr. Jos. W.....	Fox Chase.....	9	20
Webster, A. S.....	Guys Mills.....	6	9
Westlake, L. D.....	Jackson Center, R. 18, Pine Brook Farm.....	13	
Wetzel, S. S.....	Marion Center.....		19
Wimer, Wm. S.....	Slippery Rock, R. 3.....		11
Wylie, W. E.....	Grove City, R. 16.....	1	10
Yingling, C. W.....	Tryonville.....	3	18
Yoder, Lewis S.....	Elk Lick.....		31
SOUTH CAROLINA.			
Addison, G. B.....	Spartanburg.....		12
Browning, W. B.....	Ridgeville.....		116
Burgess, V. L.....	Greenville.....		26
Carson, B. G.....	Ridgeville.....		34
Chapman, E. E.....	Greenville.....	1	22
Clinkscales, C. C.....	Troy.....		26
Coleman, S. L.....	Fountain Inn.....	6	
Connie Maxwell Orphanage.....	Greenwood.....		34
Cushman, C. P.....	Windsor.....		15
Edwards, A. F.....	Darlington.....		21
Edwards, B. F.....	Greenwood.....		27
Epworth Orphanage.....	Columbia.....		29
Fowke, J. C.....	Baldock.....		24
Glover, W. F. H.....	Charleston.....		43
Gramling, B. M.....	Gramling.....		15
Green, J. M.....	Columbia, R. 4.....	5	11
Haskell, A. P.....	Columbia, R. 1.....		55
Hickson, John.....	Kollock.....	30	13
Hughes, Lizzie.....	Columbia.....		24

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
SOUTH CAROLINA—continued.			
John de la Howe Industrial School.....	Willington.....		23
Kellett, C. H.....	Owings.....		16
McCown, J. N.....	Ninety Six.....		14
Marshall, G. L.....	Greenwood.....		16
Martin, R. H.....	Summerville.....		21
Miles, Mrs. J. C.....	Edgewood.....		13
Millings, D. M.....	Greenwood.....	1	12
Moore, H. M.....	Simpsonville.....	7	5
Moore, G. E. H.....	Walterboro, R. R.....	5	25
Morris, R. F.....	Willington.....		16
Mundy, John A.....	Hodges.....		11
Mundy, W. H.....	Abbeville.....		15
Nicholson, A. L.....	Greenwood.....		24
Owens, W. B.....	White Pond.....		11
Owens, Belton.....	Camden.....		11
Owings, E.....	Owings.....		20
Owings, C. B.....	do.....	10	72
Peavy, J. W.....	Columbia.....		11
Phillips, W. M.....	Greenville.....		18
Rainsford, F. F.....	Trenton.....	9	
Reams, W. S.....	Sumter.....		17
Reams, L. E.....	do.....		12
Richardson, H. B.....	Summerton.....	5	4
Rodgers, A. W.....	Callison.....	1	11
Salisbury, F. W.....	Summerville.....		74
Scheper, Harold.....	Beaufort.....		13
Self, Dr. J. H.....	Kirksey.....		9
Shand, S. I.....	Columbia.....		20
Shirley, H. C.....	Liberty.....	13	41
Shuler, G. C.....	Vance.....		11
Shuler, A. W.....	do.....		11
Smith, S. G.....	Converse, R. 1.....		26
Smith, W. C., jr.....	Williston.....		38
Spartanburg County Farm.....	Fair Forest.....		10
State College.....	Orangeburg.....		22
Strickland, O. M.....	Columbia, R. 3.....		38
Swindler, W. O.....	Columbia.....		17
Thornwell Orphanage.....	Clinton.....		33
Toole, F. P.....	Aiken.....		32
Wash, R. A.....	Greenwood.....		19
TENNESSEE.			
Agricultural and Industrial State Nor- mal.....	Nashville.....		15
Ailey, Geo. W.....	Charleston.....		31
Alexander, P. M.....	Cleveland.....		28
Allen, H. H.....	Bartlett.....		18
Anderson, C. G.....	Memphis.....		14
Anderson, E. A.....	do.....		16
Anderson, H. B.....	Tasso.....		17
Anderson, J. C., & Sons.....	Hendersonville.....	28	
Barham, L. E.....	Riceville.....		12
Baringer, J. D.....	Raleigh.....		11
Barten, G. N.....	Buntyn.....	1	7
Bates, Mrs. L. A.....	Charleston.....	51	6
Behles Bros.....	Bartlett.....		10
Belote, T. W.....	Buntyn.....		11
Bena, J. C.....	Memphis.....		13
Benton, E. H.....	Ooltewah.....		11
Benton, R.....	East Chattanooga.....	2	6
Benton, S.....	do.....		13
Bilderbach, C. R.....	Memphis.....		12
Blake, W. S.....	do.....	1	23
Blair, J. F.....	Tasso.....	1	57
Brakebill, G. W.....	Sweetwater.....		32
Bransford, Wm. S.....	Nashville.....	28	
Brooks, G. A.....	Chattanooga.....		12
Brooks, J. A., & Son.....	Memphis.....		24
Browder, C. D.....	Sweetwater.....	9	30
Brownlee, J. W.....	Memphis.....		26
Burge, M. W.....	Neshoba.....		19
Byrd, C. L.....	Binghampton.....		10
Byrd, R. F.....	Sweetwater.....	8	23
Carpenter, J. P., & H. F.....	Brushcreek.....	9	14
Burke, Sam.....	Sweetwater.....	1	19
Cannon, A. B.....	Philadelpia.....	65	
Carpenter, W. H.....	Brushcreek.....	16	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
TENNESSEE—continued.			
Carter, W. E.	Smyrna.	19	1
Cartwright, Walter	Forest Hill.		17
Chesnutt, J. W.	Englewood.	43	2
Court, W. H.	Memphis.	3	26
Coleman, D. E.	Smyrna.	20	6
Crabtree, W. R.	Chattanooga.		50
Crittenden, B. G.	Sanford.		13
Cummins, L. P.	Kerrville.	9	18
Davis, W. C.	Raleigh.		11
Dixon, V.	Memphis.		13
Drake, J. M. P.	Whitehaven.		14
Duncan, D. W.	Tasso.		38
Eastern Hospital for Insane.	Knoxville.		48
Edgar, J. B.	Capleville.	2	6
Edwards, L. C.	Memphis.		43
Elder, Mose.	Riceville.		12
Estes, R. I.	Sweetwater.		11
Flaxner, L. H.	Memphis.		16
Friar, J. T.	East Chattanooga.		17
Gatting, W. W.	Bartlett.		19
Gettys, S. F.	Sanford.		44
Godsey, L. C.	Sweetwater.		22
Glanville, Mrs. J. T.	Neshoba.		12
Hadorn, Fred.	Memphis.		13
Haefer Bros.	Bartlett.		16
Hall, W. H., & Son.	Sweetwater.		16
Hancock, D. B.	Chattanooga.		22
Harris, M. L.	Cleveland.	20	20
Hale, W. P.	Jefferson City.	17	1
Hawk, H. H.	Memphis.	5	9
Harrison, J. M.	Hixon.		11
Herbert, J. S.	Whitehaven.		14
Hickle, O. C.	Powder Springs.	27	4
Haynes, J. M.	Murfreesboro.	13	20
Holmes, Ballard.	Whitehaven.		27
Hood, J. R.	Memphis.		10
Houston, S. C.	Forest Hill.		24
Hyatt, W. C.	Buntyn.		24
Isabell, W. M.	Whitehaven.		10
Jenkins, J. T.	Nashville.	10	23
Johnson, C. D.	East Chattanooga.		11
Johnson, J. A.	Memphis.		18
Jordan, A. L.	Franklin.	16	2
Knox, A. D.	Murfreesboro.	8	8
Lanier, C. H.	Buntyn.		14
Ledford, A. L.	Shepherd.		10
Ledford, J. L.	Tasso.	17	14
Lee, R. M.	Smyrna.	10	10
Lemons, B. O.	Binghampton.		16
Loveman, D. B.	Chattanooga.	4	2
Lynn Bros.	Buntyn.		16
Masingill, N. H.	Bristol.	18	28
McCalman, C. E.	Whitehaven.	1	12
McCarter, G. W.	Neshoba.		13
McClure, Robt.	Whitehaven.		10
McCullough, A. B.	Buntyn.		11
Mackey, D. L.	Charleston.		38
Mason, J. T.	Memphis.		11
Meek, Jeff.	Whitehaven.		12
McPherson, R. P.	do.		14
Mayfield, T. B., & Son.	Athens.	13	27
Martin, Mrs. T. L.	Shepherd.		11
Moore, A. L.	Cordova.		6
Moore, Jno.	East Chattanooga.	10	11
Moore, J. D.	Sweetwater.		15
Moon, J. P.	do.	5	11
Moore, E. H.	Russellville.	27	13
Morgan, J. W.	Sanford.		13
Moss, M.	East Chattanooga.	3	9
Myers, W. B.	Memphis.		11
Nunnally, G. W.	Bartlett.		31
Oler, J. E.	St. Elmo.		11
Owen, S. F.	Binghampton.		13
Ownby, N. L., & Loyd.	Cleveland.		43
Parker, O. B.	Memphis.		12
Perkinson, J. C.	Sanford.		28
Perry, W. W.	Hixon.	9	

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
TENNESSEE—continued.			
Ramsey-Gartley Hospital.....	Memphis.....		15
Rhea & Lewis.....	Hixon.....		13
Reagan, J. A.....	Sweetwater.....		45
Richey, J. R.....	Tasso.....		51
Richey, R. C.....	Whitehaven.....	3	6
Robb, F. W.....	Memphis.....		15
Roberts, W. A.....	North Chattanooga.....		10
Robinson, D. L.....	Murfreesboro.....	5	6
Rominger, J. N.....	Riceville.....		18
Rook, C. R.....	Buntyn.....		23
Rosensweig, A. S.....	Shepherd.....	17	3
Ranck Bros.....	Pulaski.....	36	
Rogers, C. L.....	Cordova.....	10	12
Russeil, F. E.....	Calhoun.....	3	41
Russon, W. A.....	Memphis.....		22
Schulgen, J. A.....	Tasso.....	4	11
Scott, Ralph W.....	Sweetwater.....		23
Seaborn, J. R.....	Tasso.....		11
Sigmund, J. A.....	Buntyn.....		14
Simmons, F. L.....	Tasso.....		18
Sink, M. V., & Bros.....	Buntyn.....		12
State Penitentiary.....	Nashville.....		152
Sterchi, Fred.....	East Chattanooga.....	3	9
Tennessee School for Deaf and Dumb.....	Knoxville.....		13
Thombres, Gus.....	Chattanooga.....		11
Smartt, F. W.....	Wartrace.....	32	10
Sterchi, J. G.....	Knoxville.....	100	16
Taylor, Ford.....	Whitehaven.....	2	17
Vandergriff & Pitts.....	Forest Hill.....		16
Varnell, J. O.....	Tyner.....		12
Vanover, R. V.....	Sanford.....		14
Walker, Mrs. B. B.....	Memphis.....		10
Wallace, W. P.....	Buntyn.....	2	19
Waterfield, Sam.....	Union City.....	41	
Walker, A. F.....	Bartlett.....		19
Wesson, J. W.....	Raleigh.....		10
Wierschern & Taylor.....	Whitehaven.....	2	36
Winberry, H. E.....	Bickford Station.....		12
Wilson, N. R.....	Charleston.....		28
Williams, G. M. & L. E.....	Rossville.....		18
Wofford, Will.....	Shepherd.....		10
Zachery & Bottio.....	Buntyn.....		26
TEXAS.			
Alderson, W. J.....	Katy.....		69
Baker, J. M.....	Barker.....		27
Ballard, H. B.....	Katy.....		12
Barnett, C. E.....	Barker.....		29
Beckenoff, B. F.....	Katy.....		15
Beesley, C. O.....	Cedar Hill.....	9	6
Brown Brothers.....	Cleburne.....	46	2
Cabiness, J. E.....	Katy.....		10
Denny, W. E.....	do.....		74
Ernsts, J. A.....	do.....		10
Evans, W. B.....	do.....		15
Farmers' Cooperative Society.....	do.....		21
Flowerdale Farm.....	Dallas.....	26	
Franz, A. M., Mrs.....	Katy.....		28
Franz, C. D.....	do.....		31
Friday, M. M.....	do.....		23
Goldman, H.....	do.....		13
Hagler, C. E.....	do.....		19
Houghton, G. H.....	Barker.....		26
Humphries, F. C.....	Katy.....		13
Lamb, H. C.....	do.....		26
Lasater, Ed C.....	Falfurrias, Los Meadows Ranch.....	4	188
Do.....	Falfurrias, No. 5 Ranch.....	1	38
Do.....	Falfurrias, Cabezas Blancos Station.....	189	1
Do.....	Falfurrias, Una de Grata.....	178	96
Do.....	Falfurrias, Riley Ranch.....	19	425
Do.....	Falfurrias, Claire Salada Station.....	240	1
Do.....	Falfurrias.....	6	2
Do.....	Falfurrias, Laborsitias Ranch.....	5	187
Do.....	Falfurrias, Alto Colorado Ranch.....	150	
Lawlor, N. T.....	Lone Oak.....	44	
Lindley, H. L.....	Katy.....		38

Tuberculosis Eradication under the Accredited-Herd Plan. 91

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
TEXAS—continued.			
McCord, E. L.	Katy		10
McDonald, N. A.	Cleburne	31	4
Maness, L. F.	Katy		10
Mathis, J. J.	do		42
Mays, W. B.	do		13
Porter, S. J.	do		15
Rhodes, R. A.	Barker		13
Smoover, J. M.	Katy		14
Waggoner, B. P.	Barker		43
Webb, W. H.	Dallas	19	13
Wendling, John	Barker		68
Whitson, B. B.	Katy		10
Wilkinson, F. P.	do		19
Witt, W. C.	do		20
Thompson, A. E.	do		62
UTAH.			
Bench, Geo.	Price		10
Bounhus, W.	Ogden		10
Broadbank, A. P., & Bro.	Murray		16
Bunuel, S. E.	Provo		12
Call, A. C.	Ogden		21
Clinger, Martin	Provo		16
Clark, J. S.	Draper	3	8
Christensen, R. N.	American Fork	6	
Dahl Bros.	West Jordan		63
Foulger, Herbert	Ogden	6	
Foulger Co., The	do	41	4
Harman, C.	Salt Lake City	6	
Hill, Wm.	North Ogden		12
Knudsen, Heber A.	Provo		12
Labrum, Jno. G.	Murray		13
Little Valley Dairy Farm	Ogden		13
Mann, Geo. B.	Woods Cross		12
Mitchell, E. H.	do		13
Mower, C. E.	Ogden		13
Nuttall, L. John	Provo		14
Olsen, O. C.	Clearfield		10
Green, J. E.	American Fork		10
VERMONT.			
Adams, Walter	Stowe	2	3
Angell, J. M.	Randolph Center		32
Annis, H. S.	Chelsea		13
Ariel, W. J.	Montgomery Center		19
Ashline, W. S.	Randolph Center	4	12
Austin, W. O. & W. W.	do		35
Averill, J. F. & A. M.	Barre		24
Bacon, Leonard	Chelsea	5	12
Bacon, Richard	do	10	12
Badger, C. A.	East Montpelier	11	27
Bailey, Jason B.	Montpelier		18
Baker, W. G.	Morrisville	25	6
Bancroft, L. D.	Calais	2	27
Bannister, C. J.	Randolph Center		23
Baraw, Charles	Chelsea	10	6
Barker, F. C.	Jacksonville		11
Bedell, J. W., & Son	Hardwick		13
Bell, W. D.	Westfield		11
Benson, Joseph	Stowe		49
Bernier, Charles	Williamstown		35
Bickford, F. H.	Bradford	20	
Bicknell, A. B. & J. M.	Tunbridge	5	24
Bigelow, E. L.	Stowe	2	4
Bigelow, A. G.	Randolph Center	3	
Blain, D. A.	Barnet	25	32
Blanchard, Mrs. G. E.	White River Junction		10
Bliss, S. W.	St. Albans	54	
Boardman, M. H.	Morrisville	15	34
Boyce, Otho	Stowe		12
Boyd, E. W. & H. O.	East Randolph		17
Boydson, C. I.	Randolph Center	51	1
Briggs, C. A.	Williamstown	11	10
Brockway, D. J.	West Hartford	47	21
Brousseau, George	Lowell		16
Brown, Arron I.	Worcester		18

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Brown, R. C.	Saint Albans.		29
Bruce, C. W.	Worcester.		10
Burnham, Ralph A.	South Royalton.		19
Burnham, Wayne M.	do.	6	17
Burroughs, S. H.	Vergennes.		13
Cabot, A. A.	Windsor.		14
Campbell, A. M.	South Royalton.		11
Candon, James P.	Pittsford.	4	25
Caron, O. W.	Barton.		26
Carpenter, Van B.	Randolph Center.		10
Champlen, F. R.	West Hartford.		17
Cheney, R. W.	Morrisville.		25
Clifford, E. G.	West Hartford.		31
Connal, E. N.	Newport Center.	20	5
Connal, W. R.	do.	21	12
Conrad, Roy.	Hardwick.		14
Cooney, E. S.	Middlesex.		30
Cummings, Devine.	St. Johnsbury.	18	8
Daley, Mrs. Lottie A.	White River Junction.		15
Damon, P. W.	Barton.		14
Dandelin, A. P.	Enosburg Falls.		21
Darby, J. F.	Worcester.		17
Davis, A. E.	Randolph Center.		24
Davis, F. L.	Hartford.	11	8
Davis, J. N.	Enosburg Falls.	12	22
De Almeida, Carl.	Chelsea.		15
De Brune, A. B.	Greensboro.		26
Dibbell, W. F.	Waterbury Center.	3	17
Downer, H. H.	Stowe.	5	2
Downey, M. W.	Montgomery.	2	8
Downing, Fred.	Washington.		10
Drinkwater, F. F.	Plainfield.	2	20
Durkee, A. J.	Randolph Center.		12
Dutton, R. A.	Orleans.		22
Eastman, A. G.	North Hartland.	9	11
Eastman, W. E.	Randolph Center.		15
Edson, A. E.	South Royalton.		20
Eldridge, F. D.	East Hardwick.	2	15
Emerson, F. A., & Son.	Barton.	3	28
Emery, Herbert E.	Plainfield.	22	11
England, H.	Lowell.		15
English, L. W.	Woodstock.	18	41
Ennis, Mrs. Fannie M.	Marshfield.		24
Fairbanks, B. H.	West Burke.	9	.....
Fairbanks, G. H.	Enosburg Falls.	14	16
Farr, Volney.	Randolph Center.		18
Fassett, W. G.	Enosburg Falls.	20	15
Ferland, O.	Newport Center.		14
Fitch, C. W.	East Montpelier.	3	27
Fitch, E. C.	East Calais.	2	34
Fletcher, Guy H.	Randolph City.		15
Flanders, F. A.	Washington.		17
Flint, Fred.	Williamstown.		13
Forand, T.	Westfield.		12
Ford, George F.	Randolph.		23
Foster, H. A.	Stowe.	2	29
Frisbie, E. F.	Vergennes.		22
Fullam, W. C.	Randolph Center.		17
Gadley, B. L.	Barnet.	19	5
Gaines, W. H.	Taftsville.	20	21
Gale, A. L.	Stowe.	27	16
Gale, George.	do.	10	35
Gale, P. R.	do.	10	.....
Garney, Clare W.	Cabot.		14
Gates, Charles W., Home Farm.	Franklin.		56
Gates, L. R.	Taftsville.	2	6
Gay Bros. Co.	Cavendish.	1	5
George, F. A.	Williamstown.		23
Gilbert, W. W.	Morrisville.		20
Goodrich, A. A.	Hardwick.		17
Goodrich, A. N.	Williamstown.	2	3
Grant, J. M.	Chelsea.		20
Greenfield, W. H.	Franklin.	7	20
Grenier, Bert.	Washington.		11
Harrington, W. H.	West Hartford.	16	.....
Harris, William.	Hyde Park.	2	2s
Hathaway, Eliza.	Greensboro.		10

Tuberculosis Eradication under the Accredited-Herd Plan. 93

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Hawes, H. H.	Barre		16
Hayward, C. L.	Williamstown		17
Hayward, Harry	Chelsea		11
Hazen, Allen	White River Junction	49	
Hemenway, J. F.	Chelsea		20
Hersey, Glenn	Williamstown		19
Holmes, J. C.	Randolph Center		11
Hood Farm; Hackett, manager	Chelsea	23	28
Howland, J. C.	Quechee	64	10
Hutchinson, E. C.	Williamstown		35
Ingalls, William	Greensboro		17
Jeffords, H. M.	Williamstown		29
Jennings, B. C.	East Hardwick	6	21
Johnson, George	North Craftsbury		15
Jones, F. F.	Morrisville		10
Jones, W. A.	Randolph	4	19
Judd, A. L.	South Strafford	24	
Kennedy, F. A.	Windsor	95	
Kingsley, R. W.	Montgomery Center		32
Kneeland, Homer	Johnson		11
Ladd, M. P.	Worcester	30	9
Laird, J. E.	Greensboro		21
Lamson, O., & N. F. Wheatley	Randolph Center		27
Lawrence, E. C.	Bristol	2	3
Le Clair, Lewis	Morrisville		14
Lewis, C. C.	Randolph Center		40
Lewis, R. J.	Woodstock	1	23
Lilley, Carl D. F.	Plainfield	19	27
Luce, H. W. & D. F., lower farm	Stowe		22
Magoon, B. F.	do.		21
Magoon, E. C.	do.	3	20
Magoon, Guy A.	Newport	4	28
Manchester, Mrs. F. D.	Middlebury		15
Marston, John W.	West Topsham	1	8
Martin, J. A.	Williamstown		12
Massey, Damas	East Hardwick		13
Maxham, M. C.	Worcester		18
Maynard, Roy	Enosburg Falls		24
Maxham, C. J.	Woodstock	33	14
Menard, Joseph	Chelsea	27	
Merrill, W. S.	Hardwick		20
Merrill, Wallace R.	Craftsbury		20
McDonald, J. A.	Woodstock	13	5
McLaren, H. A.	Barnet		19
Miller, Charles	Greensboro		35
Miller, George F.	Peacham		26
Miller, Henry	Greensboro		40
Moon, Owen	Woodstock	50	
Moore, W. A.	Plainfield	2	25
Monteith, E. M.	Westfield	6	13
Morse, F. R.	Plainfield		18
Morse, George A.	Morrisville		14
Morse, S. B.	Calais		13
Morse Bros.	do.	6	36
Moxley, C. H.	Randolph Center		19
Neil, C. A.	White River Junction	6	36
Newell, S. D.	Randolph Center		18
Newton, Harry D.	Johnson		24
Nichols, C. A.	Hardwick		29
Noyes, L. H.	Hyde Park		13
Packer, S. H.	Marshfield	2	10
Page, A. F.	Danville	19	
Page, R. S.	Hyde Park	44	
Palmer, Roy W.	Middlebury	10	11
Parker, F. L.	White River Junction	7	20
Parsons, H. A.	Stowe		14
Patch, C. B.	Hartland		31
Perry, A. C.	Stowe		17
Pettengill, Don	Lowell		11
Pierce, F. E.	Worcester		17
Phepps, G. W.	West Hartford		11
Pike, Perley A.	Hardwick		14
Pike, S. C.	Montpelier	8	30
Polaski, S. A.	Stowe	3	2
Poor, Fred L.	Williamstown		25
Poor, Mark	Stowe		32
Porter, M. A.	South Royalton		22
Pronto, G. H.	Lowell		22

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Rash, I. E.	Barton.	7	14
Revoir, George.	Orleans.		39
Richardson, F. L.	Randolph Center.		41
Riford, E.	East Bethel.	5	19
Riley, William.	Franklin.	7	51
Roberts, A. R.	West Hartford.	4	11
Robinson, E. G.	Stowe.		13
Robinson, I. G.	Calais.	2	41
Rowe, E. L.	Barnet.		38
Ruggles Bros.	St. Johnsbury.	25	11
Rumney, G. H.	Montpelier.	3	24
Sanborn, W. E.	Barre.		23
Savage, Joseph.	Randolph Center.		18
Savory, L. G.	Williamstown.		14
Seymour, P. F.	Randolph Center.		14
Sinclair, W. E.	Johnson.		29
Small, Fred M.	Morrisville.		51
Smith, E. W., & Son.	East Berkshire.	54	10
Smith, H. L.	do.	3	36
Snow, E. W.	Randolph Center.		36
Spaulding, D. G.	Taftsville.	6	12
Spaulding, Mary Bates.	Proctorsville.	27	
Sprague, Andrew.	Chelsea.	2	40
Sprague, H. D.	Pittsford.		29
St. Amand, A.	Orleans.		19
Stanhope, G. S.	Isle La Motte.	6	14
Stafford, C. H. A.	Morrisville.		38
Stafford, Guy C.	do.		12
Stetson, L. G.	West Hartford.	3	1
St. Peter, Edward.	Williamstown.	54	2
Stoddard, A. M.	Randolph Center.		14
Stoddard, M. W.	do.		28
Stone, C. C.	do.		26
Stone, E. A.	Williamstown.	54	2
Story, C. J.	Morrisville.	2	17
Sweeten, C. J.	Vergennes.		30
Sweet, A. P.	Lowell.	2	6
Tacey, Charles.	Barre.		15
Talbot & Call.	Stowe.	3	22
Temple, A. H.	Montpelier.		19
Terrill, G. E.	Morrisville.	6	36
Theriault, D. V.	Williamstown.		26
Thompson, C. L.	Plainfield.		37
Thresher, Ray.	Chelsea.		21
Tillotson, Homer.	Lowell.		18
Towle, Harrison W.	Enosburg Falls.	25	21
Towle, S. C.	do.	45	
Trask, E. J.	Randolph Center.		19
Trow, F. N.	Barre.	3	25
University of Vermont.	Burlington.	5	37
Vail, Solon.	South Royalton.	30	
Valiquet, P. W.	Enosburg Falls.		26
Vanesse, Ovilla.	Stowe.	2	35
Vermont Marble Co., Wilkins Farm.	Proctor.		80
Villeneuve Bros.	Coventry.		36
Vondle, Peter.	Danville.		13
Walbridge, J. H., & Son.	Williamstown.	2	15
Warner Bros.	Lowell.		24
Warner, R. N.	Vergennes.		22
Waterman, C. W.	White River Junction.	2	8
Waterman, George A.	Royalton.	19	1
Watson, Alfred E.	Hartford.	5	3
Watts, C. W.	Stowe.		11
Wheatley, M. S.	Randolph Center.		19
Wheeler, Frank H.	Proctorsville.	8	
Wheeler, M. P.	Worcester.		10
White, A. P.	Brookfield.		27
Whitney, C. F.	Hardwick.		14
Wilcox, R. S.	Brookfield.		22
Wilder, Allen D.	Franklin.		31
Wilder, B. E., upper farm.	Enosburg Falls.		34
Willey, F. A.	Irasburg.		15
Williams, J. H.	Randolph.		19
Wood W. L.	West Burke.	6	23
Woodward, L. D.	Richford.	6	27
Woodward & Nichols.	Enosburg Falls.	48	31

Tuberculosis Eradication under the Accredited-Herd Plan. 95

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
VERMONT—continued.			
Wool, Ralph J.....	Essex Junction.....	17	11
Wright, C. O.....	Franklin.....	4	30
Wright, Seaver D.....	White River Junction.....	26	1
Young, E. M.....	Chelsea.....	2	17
Young, George C.....	Morrisville.....		15
VIRGINIA.			
Anderson, D. P.....	Danville.....		14
Beard, S. C.....	Emory.....	4	1
Beazley, E. S.....	Somerset.....	3	5
Bowman, A. M.....	Salem.....	40	
Bradshaw, W. M.....	Franklin.....		35
Buchanan, J. J.....	Hampton.....		10
Burns, W. B.....	Williamsburg.....	6	15
Buston, J. G.....	Tazewell.....	6	74
Chesbro, J. M.....	Claremont.....	1	6
Clapp, H. M.....	Hampton.....		12
Clark, W. H.....	Meadow View.....		29
Cox, D. B.....	Ashland.....		24
Cullen, D. C.....	Midland.....		12
Dodson, Frank.....	Bealeton.....		16
Ellis, A. C.....	Lyndhurst.....		16
Frederick, D. F.....	Waterlick.....		17
Gordon, R. O.....	Leavells.....		14
Harris, J. L.....	Hampton.....		11
Harrison, Wm. O.....	Charlottesville.....		10
Hildrup, E. T.....	Fredericksburg.....	2	12
Hillyard, E. I.....	Forestville.....	2	5
Holmes, E. S.....	Leesburg.....	3	40
Lucerne Dairy Farm.....	Ashburn.....		52
Owen, C. T.....	Winchester.....	1	4
Pancoast, H. T.....	Purcellville.....		13
Ritter, O. B.....	Middletown.....		24
St. Clair, D. A.....	Wytheville.....	2	15
St. Edith Academy.....	Bristow.....		25
Sanford, Wallace.....	Madison Run.....	4	29
Schrock, S. D.....	Princess Anne.....		11
Smucker, D. M.....	Oysterpoint.....		12
Snodgrass Bros.....	Lodi.....		17
Stone, A. D.....	Bealeton.....		15
Storey, J. T., & Bro.....	Ruckersville.....		18
Tench, T. K.....	Lyndhurst.....		21
Thonesen, C. M.....	Lightfoot.....		11
Tiller, W. C.....	Richmond.....		19
Utgard, M. H.....	Spring Grove.....	7	11
Vandervies, A. J.....	Oakton.....		10
Wade, G. W.....	Franklin.....		30
Weam, L. R.....	Catlett.....		33
Weeks, S. H.....	Remington.....		14
Willis, J. M., jr.....	Hampton.....	1	12
Wilson, Jas. A.....	Lyndhurst.....		13
Wolfe, D. L.....	Lodi.....		12
Wolfe, P. E.....	Glade Spring.....		10
Wolfe, W. M.....	do.....	1	11
Yager, Henry.....	Somerset.....	4	62
Yoder, J. H.....	Denbigh.....		12
WASHINGTON.			
Adolphsen, A.....	Chehalis.....	12	15
Anderson, F. C.....	Richland.....	7	
Angle, George N.....	White Bluffs.....		11
Baldwin, L. M.....	Colbert.....		10
Brannick, N. S.....	White Bluffs.....		11
Burch, D. W.....	do.....		17
Callery, M. B.....	Colbert.....		11
Cole, Carl F.....	Hillyard.....		16
Cosner & Huddleson.....	Colville.....		34
Crabtree, B. C.....	Lynden.....	14	
Crawford, R. E.....	Colbert.....		14
Curtis, Virgie.....	Centralia.....		14
Elliott, W. J.....	Colbert.....		23
Fitch, J. B.....	Walla Walla.....		21
Glendale Creamery.....	Chimacum.....	35	75

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WASHINGTON—continued.			
Haile, J. E.	Colbert.		19
Harrison, B. E.	East Sound		19
Hess, G. C.	Walla Walla.		18
Hewitt, F.	Hillyard		20
Hudleson, W. M.	Colville.		10
La Point, Ernest H.	Cheney.		11
Leigh, E.	do.		11
McCullum, C. E.	do.		14
McGilvary, C. R.	Walla Walla.		24
Miller, J. L.	do.	7	
Morton, J. R.	Winlock.	5	14
Plaquet, O. C.	Walla Walla.		16
Pool, S. O.	Wenatchee.	13	
Powers, B. W., & Sons.	Palouse.	36	
Rogers, Dewey.	Spokane.		13
Rogers, John.	Cheney.		10
Sinclair, John T.	Chehalis.		16
Skeels, H. T., Sons.	Addy.	21	
Skeels, Robert L.	do.	7	
Smith, O. D.	Colbert.		16
Sorenson, N. C.	Onalaska.	15	
Spence, William C.	Cheney.		19
Tanner, R. I.	Sumas.	25	
Travaille, C.	Walla Walla.		18
Waikiki Farm.	Spokane.	12	
Washington State College.	Pullman.	18	
WEST VIRGINIA.			
Allen, Mrs. Ada V.	West Alexander, Pa.		18
Anderson, B. D.	do.		14
Argabrite, Rose.	Lewisburg.		18
Atkins, Baines.	Guthrie.		15
Atkinson Bros.	West Alexander, Pa.	6	31
Baird, W. C.	Elm Grove.		12
Baird, J. W.	do.		10
Bailey, J. J.	Huntington.		16
Bates, J. L.	do.		13
Bell, N. J.	Triadelphia.		10
Bias, Theodore.	Huntington.		31
Bicar, P. J.	do.		16
Black, S. P.	Apple Grove.	1	53
Bland, J. E.	Huntington.		10
Blatt, A. M.	do.	2	11
Bonar, J. P.	West Alexander, Pa.	6	10
Botkins, W. H.	Charleston, R. R.		16
Bowman, G. A.	Short Creek.		22
Brooke, F. S.	Huntington.		13
Bruner & Son, Chas.	West Alexander, Pa.		27
Bullard, A. H.	Triadelphia.	1	12
Chapman, W. E.	Huntington.		14
Childers, R. S.	Charleston, R. 2.		12
Clendennin, W. C.	West Alexander, Pa.	1	24
Coffield, D. W.	do.	11	7
Connell, Norwell.	Charleston, R. R.	9	11
Cox, H. H.	Huntington.		21
Criswell, W. L.	Fulton.		16
Davis, W. E.	West Alexander, Pa.		21
Ditto, William O.	Falling Waters.	2	4
Donnelly, G. W.	Charleston, R. R.		10
Dixon, Lee.	West Liberty.		16
Fisher, C. B.	Elm Grove.		11
Fisher, L. E.	do.		21
Frantz, L. W.	Huntington, R. R.	12	
Gamble, W. W.	Sherrard.		17
Garland, Daniel R.	2336 Ninth Avenue, Huntington.		18
Garrison, A. R.	West Alexander, Pa., R. R.	13	12
Garrison, T. P.	do.	1	30
Garvin, D. M.	Wheeling, R. 2.		33
Gibson, F. M.	Triadelphia.	5	13
Giffin, W. A.	do.	2	10
Giffin, J. H.	do.	1	11
Gould, Worth.	Buckhannon, R. R.		11
Grishaber Bros.	Charleston, R. 2.	1	25
Handley, J. A.	Lewisburg.		25
Horne, L. V.	Morgantown, R. 6.	12	13
Hartlieb, Lewis.	West Alexander, Pa.		31

Tuberculosis Eradication under the Accredited-Herd Plan. 97

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WEST VIRGINIA—continued.			
Hedges, Archie.....	Short Creek.....		14
Island Creek Coal Co.....	Holden.....	1	37
Jenkins, E. F.....	Triadelphia.....		12
Johnson, J. B., & John.....	do.....		10
Johnson, Geo.....	do.....		12
Johnson, R. S.....	Fort Springs.....	1	17
Keck, Chas.....	Valley Grove.....	16	2
Kimmons, H. G.....	do.....	16	11
Kress, John A.....	Huntington, R. 3.....		12
Lawson, Jack.....	Huntington, R. 2.....	18	
Leach, S. E.....	Red House, R.....	16	8
Leitner, Jacob.....	Huntington, R. R.....		10
McKinney, J. E.....	Guthrie.....		11
McMillan, Carl.....	Falling Waters.....		11
McWoodrum, M. C.....	Huntington, R. R.....		12
Main, W. S.....	West Alexander, Pa., R. R.....		12
Malcolm, M. K.....	Institute.....		17
Manley, John R.....	Monongah.....	15	
Melrose, M. A.....	Huntington.....		17
Mounts & King.....	West Alexander, Pa., R. R.....		23
Mull, J. L.....	Wheeling.....		32
Myers, C. E.....	Huntington, R. 1.....		20
Newcomb, E. L.....	Huntington, R. R.....		17
Nichols, W. Va.....	Triadelphia.....		15
Neidermyre, A. E.....	Benwood, R. 3.....		18
Omps and Triggs.....	Kearneysville.....	5	7
Orr, C. P.....	Triadelphia, R. 1.....		11
Orr, J. M.....	Triadelphia, R. 1.....		11
Phillips, Tracy.....	Buckhannon.....	4	7
Powell, W. E.....	Triadelphia.....		13
Reick, Carl.....	Wheeling, R. R.....		12
Riling, O. H.....	Charleston, R. R.....		25
Rogers, Mrs. M. J.....	West Alexander, Pa.....	3	16
Schentznier, August.....	West Alexander, Pa., R. R.....	1	8
Scheibelhood, B. B.....	Huntington, R. 3.....	7	4
Shafer, C. N.....	Wheeling-Glenwood.....	3	14
Shafer, Henry.....	Elm Grove.....		10
Simpson, Joseph.....	Triadelphia.....		14
Simpson, S. F., & Son.....	Wheeling, R. 2.....	1	21
Sims, C. C.....	Lewisburg.....		17
Sims, O. T.....	Short Creek.....	6	3
Smith, J. E.....	Wheeling-Glenwood.....		24
Sonda, Chas.....	West Liberty.....	4	17
Sperow, J. Holland.....	Hedgesville.....	9	6
Steenberger, P. H.....	Point Pleasant.....		17
Stinger, J. J.....	Short Creek.....		17
Straub, Geo.....	West Alexander, Pa., R. 4.....		14
Stribbling, M. W.....	Mercers Bottom.....		14
Sullivan, W. E.....	Charleston, R. 3.....		10
Supler, E. W.....	Triadelphia, R. 1.....		17
Taylor, H. R.....	Huntington, R. R.....		10
Thor, Z. E.....	Mineral Wells.....	5	2
Tuttler & Ruch.....	Wheeling, R. 1.....		12
Waddell, Williams.....	Short Creek.....		19
White, Mrs. Mary.....	Wheeling, R. 2.....		13
Williams, P. B.....	Triadelphia.....		12
Williams, Lester & John.....	West Alexander, Pa., R. R.....	1	45
Zeidler, Henry.....	Short Creek.....		19
WISCONSIN.			
Amberg, Jacob, & Son.....	Hillsboro.....	30	
Armour, W. H. & Son.....	Mondovi.....	9	31
Bromley, Ed., & Sons.....	Elkhorn.....	25	11
Buchanan, Hugh.....	Viroqua.....	46	5
Curran, Frank P.....	Taylor.....	24	16
Davidson, Jens.....	Westby.....	21	
Dillon, Jas., & Son.....	Mondovi.....	12	24
Fawcett, Louis.....	Stanley.....	20	
Ferguson, L. L.....	Grand Rapids.....	10	14
Follstad, Carl.....	Elcho.....	7	5
Frihart, H. C.....	Weyauwega.....	17	8
Gillett, Harry T.....	Antigo.....	2	8
Guenthner, Harry.....	do.....		17
Haeuser, Edw. A.....	Fountain City.....	2	22

JERSEY—Continued.

Name.	Address.	Cattle once tested with- out reactors.	
		Purebred.	Grade.
WISCONSIN—continued.			
Hamlyn, W.	West Bend.	16	15
Holt, Henry, & Son.	Oconomowoc.	24	14
Houser, W. L.	Mondovi.	7	8
Hunt, Geo.	Antigo.	1	17
Kelly, Arthur.	Hudson.	22	1
Knudson, Math.	West Salem.	17	29
Krippener, G. M.	Rice Lake.	15	3
Langworthy, Fred F.	Augusta.	11	4
Lamb, W. A.	Roberts.	17	30
Lensing, August.	Deerbrook. ....	.....	15
Mayher, J. A., & Son.	Grand Rapids.	15	2
Matthys, Albert.	Barron.	12	5
Matthys, Walter N.	do.	11	7
Noonan, Jas.	Mauston.	9	20
Oertel, A. R.	Royalton. ....	.....	31
Ofstedahl, Walter.	Holmen.	2	50
Olson, Chris. & Sons.	Grand Rapids.	6	2
Oppedal, R. G.	Antigo.	8	10
Pattison, Francis.	Durand.	7	22
Rasmussen, Chas.	Weyauwega.	8	15
Richter Bros.	West Bend.	21	.....
Rocheleau, W. B.	Grand Rapids.	9	6
Rockwell, F. A., & Son.	Mondovi.	5	13
Rodgers, Wm. C.	Baraboo.	16	6
Schotte, Chas.	Antigo.	6	21
Schroeter, Gustave.	Grafton.	2	13
Seyforth, F. J., & Son.	Mondovi.	27	17
Smiley, J. P.	Orfordville.	33	.....
Staffin, Melvin.	Coon Valley.	46	.....
Taylor, Mrs. S. G.	Mauston.	20	1
Wagstaff, W. J.	Oshkosh. ....	.....	31
Do.	do. ....	.....	24
Warmington, P. G.	Honey Creek.	37	1
Wells, L. A.	Mauston.	19	1
Whitney, A. R.	Elderon. ....	.....	15
Wilms, W. H.	Neenah.	8	24
Total (Jersey, United States).....	.....	17,454	45,166

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN

SUPPLEMENT 2 TO
HERD LIST NO. 3

LIST OF ABERDEEN ANGUS, BROWN SWISS, DEVON,
DUTCH BELTED, GALLOWAY, HEREFORD, RED
POLLED, AND SHORTHORN HERDS WHICH HAVE
PASSED ONE OFFICIAL TUBERCULIN TEST WITH
A VIEW TO BEING ACCREDITED

J. A. KIERNAN, Chief



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 144

Contribution from the Bureau of Animal Industry
JOHN R. MOHLER, Chief

Washington, D. C.

Revised to June 30, 1920

CONTROL with a view to the eventual eradication of tuberculosis in cattle is being accomplished by systematic efforts of Federal and State authorities in cooperation with cattle breeders' associations and herd owners.

A plan was adopted in 1917 whereby herds of cattle passing the prescribed number of official tuberculin tests should be certified or accredited as free from tuberculosis.

An accredited herd is one that has successfully passed two annual or three semiannual tuberculin tests applied by regularly employed veterinary inspectors of the Bureau of Animal Industry or of the State where cooperative work is conducted, and has otherwise complied with the regulations governing the work.

The following list shows herds that have passed successfully one test, without reactors, with a view to certification. If the status of any of the herds on this list is changed, prompt notice of the fact will be furnished to the officials of the various States.

TUBERCULOSIS ERADICATION UNDER THE ACCREDITED-HERD PLAN.

SUPPLEMENT 2 TO HERD LIST NO. 3.

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Shorthorn.....	19
Milking Shorthorn.....	48
Polled Shorthorn.....	49

NOTE.—For a list of accredited herds of all breeds and of once-tested herds of breeds other than those listed here, apply to the Bureau of Animal Industry, United States Department of Agriculture.

LIST OF ONCE-TESTED HERDS OF NOT LESS THAN 5 PUREBRED OR 10 GRADE CATTLE, SHOWING OWNERS, BREEDS, AND STATES IN WHICH LOCATED.

ABERDEEN ANGUS.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
ARKANSAS.			
Trustee, A. H. Endowment.....	Jonesboro.....	23	.....
Crockett & Sons, W. L.....	Piggott.....	2	14
Kosky & Sons, J. P.....	do.....	7	6
Tilley, W. P.....	Prairie Grove.....	11	.....
University of Arkansas.....	Fayetteville.....	7	3
FLORIDA.			
J. J. Logan.....	Dinsmore.....	11	154
ILLINOIS.			
Barton, F. C.....	Cornell.....	3	20
Barton, Frank D.....	do.....	13	13
INDIANA.			
Brown, C. S.....	Newcastle.....	17	3
Carpenter, O. O.....	do.....	14	.....
Cecil & Sons, A. S.....	Muncie.....	62	18
Dyer, Ernest.....	New Goshen.....	8	1
Fink, Walter.....	Mount Comfort.....	18	2
Fleming, Wm. W.....	Remington.....	11	0
Forgy & Lewis.....	Royal Center.....	5	.....
Gray, Edward Y.....	Goodland.....	11	2
McCafferty, A. J.....	Miami.....	15	7
McClure Sisters.....	Vincennes.....	13	13
Miller, Mark E.....	Peru.....	30	4
Niederhaus, Fred.....	Staser.....	22	1
Phares, W. A.....	Tipton.....	41	10
Reberger, George.....	Brazil.....	0	4
Runyan, C. A.....	Peru.....	14	6
Suhling, J. A.....	Princeton.....	8	12
Thompson, H. A.....	Cortland.....	25	17

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

ABERDEEN ANGUS—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
IOWA.			
Dallner, F. S.	Lockridge.	19	11
Finer, A. A.	Forest City.	1	13
Iowa State College.	Ames.	19	
Miles, Sayer J.	Newton.	47	
Sunderman, Alvin.	Clarinda.		16
Tudor, J. M. & Son.	Iowa City.	11	
White, J. C. Bros.	Perry.	7	3
KANSAS.			
Bushong, G. A.	Richland.	34	24
Dietrich, Geo. A.	Carbondale, R. 1.	26	2
Klein, J. J.	Reece.	20	3
McAdams, G. M.	Holton.	18	5
Roach, J. N.	Muscotah.	11	
Wingert, Samuel.	Emporia.	11	18
Wilcox Estate, A. D.	Muscotah.	94	16
KENTUCKY.			
Allen, Harvey J.	Georgetown.	33	2
Barrett, O. F.	Maysville.	15	19
Burdette, S. N.	Columbia.	18	4
Carson, E. V.	Hustonville.	8	3
Flarity, M. J.	Maysville.	32	11
Marvin, C. E.	Paynes Depot.	20	5
LOUISIANA.			
Natalbany Lumber Co.	Natalbany.		229
MAINE.			
Allen, E. L.	Bangor, R. S.	8	
MASSACHUSETTS.			
Burnham, F. W.	Greenfield.	24	
MINNESOTA.			
Abrahamson, P.	Lanesboro.	58	2
Benesh, Frank.	Glenville, R. 4.	9	
Bolstad, Henry.	Dawson.	13	
Bolstad, Joseph.	do.	3	2
Bone, T. A.	Beardsley.	30	2
Boyce, W. I.	Fairmont.	3	26
Chamberlain Bros.	Hastings.	12	20
Chamberlain, E. H.	do.	7	
Greenwalt, James.	Withrow.	7	9
Gustafson, Adolph.	Solway.	21	
Hansen, James F.	Canby.	35	3
Lind, Albert F.	Bertha.	21	2
Milne, Geo. H. & Son.	Preston.	31	67
Ostrem Bros.	Lanesboro, R. 1.	6	25
Petts, John S.	Truman, R. 2.	12	7
Skotterud, Peter O.	Dawson.	15	9
Taylor, T. A.	Dundas.	19	7
Ulvestad, Peter J.	Whalan.	30	8
Zimmerman, J. W.	Racine.	2	18
MISSISSIPPI.			
Aldrich, J. M. & Son.	Michigan City.	81	49
Dockery, C. P.	Hernando, R. 1.	26	62
Miers, W. M.	Grenada.	3	24
Tippah Farms.	Cotton Plant.	77	4
MISSOURI.			
Coffman, Pleas.	Savannah.	12	16
Dickinson, M. U. & Son.	Carrollton.	78	2
Eubank, J. R.	Huntsville.	3	12
Great Western Land Co.	Poplar Bluff.	33	3
Holt, W. A.	Savannah.	49	2
Jones, J. M.	Everton.	35	10
Kinder, J. G.	Cuba.	29	6
Miller, Wash.	Oak Ridge.	18	8

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

ABERDEEN ANGUS—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MISSOURI—continued.			
Montgomery, C. L.	Smithton	5	33
Nease, M. L.	Marshfield		18
Patton, George R.	Huntsville	20	4
Ponder, Chas. A.	Biehle	3	14
Standley, S. P.	Norborne	1	14
Turner, J. S.	Fairfax	22	7
Yonel, J. N. M.	Tarkio	17	7
MONTANA.			
Sun River Stock and Land Co.	Helena	28	9
Varco & Hart	Sidney	33	73
NEBRASKA.			
Weeks, W. F.	Palmer	49	5
NEVADA.			
University of Nevada, Animal Husbandry Department	Reno	5	
NEW YORK.			
Eckhardt, C. W.	Armonk	24	3
NORTH CAROLINA.			
Armstrong, C. B.	Gastonia	15	3
French, A. L., & Son	Draper	31	1
Johnson, Rufus	Charlotte	14	17
Klutz, Geo. Y.	Rockwell	21	2
Love, J. J.	Newton	7	2
Morrison, J. G.	Stanley	14	7
Ramseur, W. D.	Bessemer City		10
Sanford & Rich	Mocksville	4	1
Weaver, W. T.	Asheville		30
NORTH DAKOTA.			
Aaker, C. E.	Hatton	1	17
Acton, Willier C.	Arvilla	16	9
Berg & Haagensen	Cummings	19	
Bye, Casper	Crary	1	11
Divon, H. W.	Tioga	14	
Dodson, W. R.	Grand Forks	10	
Finch, Charlie	La Moure	26	
Hartley Stock Farm	Page	81	14
Hofstrand, Martin	Brinsmade	7	6
Hogensen, Dr.	Hillsboro	21	11
Johnson, Livy	Cogswell	65	2
Johnson & Teal	Oakes	15	10
Montgomery, T. C.	Harvey	1	20
Mullen, M. J.	Fortuna	8	
Neverman, Carl	La Moure	10	5
Orgard, John	Yucca	11	
Perry, Clinton M.	Nome	12	23
Peterson, Nels	Hankinson	8	4
Pulley, Jesse	Flasher	1	25
Rommie, John	Bowbells	3	13
Stack, Henry	Hankinson	7	9
Sterner, M. W.	Walcott	6	14
Wolf Bros.	Colfax	9	12
OHIO.			
Barnett, John C.	Urbana	27	2
Brown, H. M.	Hillsboro	30	10
Ferguson, Walter	Xenia	32	5
Jones & Son, A. W.	Larue	104	16
Rohrer, Harvey E.	North Lima	4	3
Sanders & Son, E. E.	Leesburg	19	6
Satterfield, W. C.	West Union	28	2

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

ABERDEEN ANGUS—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
OKLAHOMA.			
A. & M. College.....	Stillwater.....	13	7
Alson, William.....	Britton.....	68	7
Blandford, H. E.....	Hayward.....	45	3
PENNSYLVANIA.			
Hyde, T. E.....	Bloomsburg.....	14	.....
SOUTH CAROLINA.			
Bates, W. W.....	Jamison.....	6	.....
Calvert, W. A.....	Abbeville.....	.....	15
Taylor, I. B.....	Greenwood.....	6	10
SOUTH DAKOTA.			
Cassels, H. W.....	Groton.....	.....	23
Soladay, Annie L.....	Fulton.....	4	13
TENNESSEE.			
Alexander, J. E.....	Lenoir City.....	18	15
Bowman, Jno. F.....	Cleveland.....	46	10
Brewer & Bradley.....	Sweetwater.....	2	26
Clark, Howard.....	Morristown.....	16	2
Drake, G. W.....	Orlinda.....	16	6
Hampton, E. L.....	Nashville.....	24	5
Huggins, Dr. J. I.....	Dandridge.....	43	14
Lea, Col. Luke.....	Nashville.....	34	1
Miller, Dr. W. R.....	Brownsville.....	20	.....
Noe, W. R.....	Morristown.....	24	4
Ridley, W. P.....	Columbia.....	7	7
Sams, J. W.....	White Pine.....	9	9
Shaw, J. W.....	Edgote, Ky.....	13	22
Sutherland, R. W. & J. F.....	Mountain City.....	43	10
Todd, A. L.....	Murfreesboro.....	37	7
Trobauch & Hopper.....	Tate.....	15	2
VIRGINIA.			
Bell, J. R. K.....	Pulaski.....	36	.....
Clark Bros.....	Lodi.....	8	12
Crockett, J. N.....	Wytheville.....	13	4
Luttrell, H. M.....	Delaplane.....	14	8
Moore, W. B.....	Wytheville.....	.....	11
Ruff, S. T.....	Thaxton.....	9	13
Warden, Henry.....	Fredericksburg.....	.....	40
WEST VIRGINIA.			
Handley, T. A.....	Lewisburg.....	.....	19
Hoffman, Dr. M. G.....	Bunker Hill.....	.....	25
Karickhoff, Jas. L.....	Buckhannon.....	1	14
WISCONSIN.			
Ganz, E. F., & Son.....	Alma.....	36	3
Gelbach, W. L., & Son.....	Lancaster.....	48	1
Larson, J. T.....	Ellsworth.....	7	13
Roser, L. C.....	Baraboo.....	4	6
Total, (Aberdeen Angus, United States).....		3,259	2,007

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

BROWN SWISS.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
ILLINOIS.			
Bachman, A. D.	Morton.	3	2
Bennehoff, Claire R.	Dakota.	3	16
Burrows, Chas.	Washington.	6	1
Eigsti, Jacob.	Morton.	3	5
Faust, Emil.	Cullom.	11	1
Gerber, Peter.	Tremont.	9	3
Heiser, R. A.	Pekin.	2	5
Merchanthaler, Joseph.	Morton.	3	6
Montgomery, A.	Walnut.	13	4
Moore, Jesse C.	Morton.	17	
Moser, S.	Tremont.	12	4
Naffziger, Oscar.	Pekin.	4	4
Naffziger, W. E.	do.	4	4
Plattner, David.	Morton.	12	
Sauder, Wm.	Tremont.	6	1
Schoenbein, E.	Morton.	4	1
Schrock, Edward.	Pekin.	5	6
Wagner, D. A.	Brimfield.	9	
IOWA.			
Doran, E. D.	Bayard.	35	4
Funneimark, Olaf.	Wesley.	1	13
Hefty, S. B., & Son.	Renwick.	32	11
Willman, A. W., & Son.	Hawkeye.	34	3
KANSAS.			
Snow, Edwin P.	St. Paul.	11	
MICHIGAN.			
English, A. G.	New Troy.	7	8
Krauss, Erwin H.	Sebewaing.	10	
MINNESOTA.			
Brunold, John.	Rochester.	23	17
Buol, Peter.	Wabasha.	9	11
Lang, Fred.	St. Peter.	1	24
Matthews, August.	Glencoe.		16
Matthews, Henry.	do.		17
Minette, F. P., & Son.	Sauk Center.	29	
Neuschwander, C. F., & Son.	Redwood Falls.		14
Neuschwander, Chas.	do.	25	
NORTH DAKOTA.			
Estensen, J. C.	Hickson.		23
OHIO.			
Hull Bros.	Painesville.	49	
VERMONT.			
Morrison, F. W.	Saxtons River.	34	6
WASHINGTON.			
Phelps, O. O.	Dryad.	5	
WISCONSIN.			
Aitken, R. H.	Westboro.	2	13
Ayers, H. W.	Honey Creek.	30	
Boody, A. C.	Hudson.	28	
Burrow, C. W.	Beloit.	5	8
Cooper, John.	Clinton.	38	2
Ehrlinger, Wm.	Hanover.	8	15
Elmer Bros.	Monroe.	26	4
Fraser, David.	Honey Creek.	15	
Hibbard & Stoneman.	Syene.	16	14
Salisbury, Mrs. E. L.	Minong.	21	
Schmid, N. C.	Monroe.	28	14
Skinner, B. E.	Beloit.	21	1
Total (Brown Swiss, United States).		673	301

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

DEVON.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
	MISSOURI.		
Case, J. A.	Concordia.	50	
	NEW HAMPSHIRE.		
Marshall, E. H.	Hanover.	32	
	VERMONT.		
Dodge, H. J.	East Burke.		25
Total (Devon, United States) ....	.....	82	25

DUTCH BELTED.

ARKANSAS.			
Waldrip, W. G.....	Magness.....	11	14
FLORIDA.			
Dupuis, Dr. J. G.....	Lemon City.....		175
INDIANA.			
Sanford, W. J.....	Lebanon.....	9	.....
MICHIGAN.			
Kirby, E. J.....	Covert.....	15	4
OKLAHOMA.			
Miller Bros.....	Bliss.....	13	75
Total (Dutch Belted, United States).....		48	268

GALLOWAY.

KANSAS.			
Hill, J. M.....	Sedgwick.....	19	.....
Reilly, John.....	Emmett.....	61	7
NORTH DAKOTA.			
Greene, E. E.....	Fullerton.....	20	6
Skeels, L.....	Regan.....	10	59
Trygg Bros.....	Baldwin.....	10	.....
SOUTH DAKOTA.			
Cassels, H. W.....	Groton.....		56
Collier, W. W.....	Andover.....	3	15
Total (Galloway, United States).....		123	143

HEREFORD.

ALABAMA.			
Allen, B. M.....	Allenville.....	50	288
Cotton, F. W.....	Guerryton.....	50	.....
Fletcher, Mrs. John.....	Opelika.....	1	34
Gammage, C. M.....	Eufaula.....	7	12
Legg, Henderson.....	Athens.....	5	5
Magnolia Farms.....	Muscogee, Fla.....	2	101
Swallows, W. C.....	Gallion.....	24	4
ARKANSAS.			
Trustee, A. H. Endowment.....	Jonesboro.....	21	.....
Blackshare, C. E.....	Piggott.....	5	.....
Crossett Cattle Co.....	Crossett.....	29	.....
Rose, R. C.....	Osceola.....	15	.....

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
GEORGIA.			
Barnes & Rice.....	Dublin.....	32	
Florence, W. L.....	Powder Springs.....	20	
Morgan, T. W.....	Morganville.....	66	
State College of Agriculture.....	Athens.....	28	
IDAHO			
Blanchard, Walter.....	Buhl.....	82	7
Hares, G. C.....	Churchill.....	15	5
Paree, Frank.....	Rupert.....	32	
ILLINOIS.			
Anderson, A. A.....	Leland.....	34	6
Anderson & Frazier.....	Waterman.....	24	4
Bane, Louis.....	Le Roy.....	42	5
Barclay, T. Dean.....	Macomb.....	13	2
Davies, Evan.....	Sheffield.....	17	6
Dixon, Joseph.....	Stronghurst.....	31	5
Heeg, H. J.....	Hinckley.....	20	2
Hurdle, J. F.....	La Harpe.....	3	9
Isley, R. A.....	Wheeler.....	10	1
Johnson, T. R.....	Stronghurst.....	8	4
Louden, J. W.....	La Harpe.....	4	3
Reedy, W. J.....	Stronghurst.....	11	8
Witt, Fred.....	Leland.....	35	1
INDIANA.			
Addington, Geo. E.....	Ridgeville.....	5	3
Allen, H. H.....	do.....	11	
Carmen & Son, Ben.....	Ladoga.....	17	27
Coffman, Frances M.....	Columbus.....	6	10
Fox, Frank P.....	Oaklandon.....	204	44
Gudgel, L. W.....	Oakland City.....	7	1
Hageman, Fred O.....	Mount Vernon.....	121	3
Harper, Carey & Eva.....	Lizton.....	22	7
Hollowell, Birch.....	Ridgeville.....	5	5
Modlin & Son, W. O.....	Upland.....	18	9
Priddy & Son, J. L.....	Warren.....	78	27
Rayburn, John.....	Muncie.....	9	4
Tuhey, Earl.....	do.....	12	2
Van Natta, J. W.....	La Fayette.....	82	2
Van Voorst, Gilbert.....	Chalmers.....	29	23
Voliva Bros.....	Bloomington.....	23	3
Volker, J. W.....	Somerville.....	16	4
Wilkey & Co., Wm. A.....	Sullivan.....	106	2
Williams, A. R.....	Winchester.....	16	14
Yeager & Montgomery.....	Owensville.....	35	5
IOWA.			
Adams, John D.....	Wellman.....	40	9
Brown, A. F.....	Jefferson.....	21	3
Clayton & Burley.....	Clarinda.....	45	2
Dellinger, John.....	Rockwell City.....	11	
Iowa State College.....	Ames.....	14	
Netolicky, Anton.....	Mount Vernon.....	15	2
Olsen, P. M.....	Newhall.....	29	6
Olson, John P.....	do.....	67	4
Rathje, Mrs. Anne.....	Atkins.....	1	34
Reber, Noah.....	Wellman.....	18	3
Rouse, M. T.....	Thompson.....		35
Shettler, Henry J.....	Wellman.....	14	7
Wertz, C. A.....	Wellman, R. 3.....		14
KANSAS.			
Bingham, George.....	Bradford.....	109	4
Blythe, J. L.....	White City.....	42	17
Brotherson, M. C.....	Lindsborg.....	16	2
Black & Hurlburt.....	Lakeland.....	69	633
Eaton, Sam.....	McPherson.....	30	4
Greenleaf, J. W.....	Greensburg.....	644	260

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
KANSAS—continued.			
George, Frank.....	Olivet.....	17	6
George, Russell.....	do.....	12	11
Hanna, Ray E.....	Clay Center.....	40	2
Jones, E. S.....	Emporia.....	83	2
Johnson, V. O.....	Aulne.....	94	25
Lillian, E. E.....	Hartford.....	55	1
Lawrence, F. A.....	Meriden.....	5	2
Mueller, W. C.....	Hanover.....	38	104
Mochle, J. W.....	Clay Center.....	9	4
Rosander, C. G.....	Lindsborg.....	38	24
Sellberg, Edwin J.....	McPherson.....	33	11
Skeen, J. A.....	Eskridge.....	33	7
Schmidt, J. F.....	Waverly, R. 1.....	7	60
Shobe, Ralph R.....	Burlington, R. 1.....	7	6
Woolf, H. M.....	Bonner Springs.....	42	4
Williams, B. K.....	Broughton.....	23	78
KENTUCKY.			
Alexander, L. P.....	Wheatley.....	19	.....
Ashbrook, W. A.....	La Center.....	6	19
Brown, J. V.....	Nebo.....	14	29
Cecil, C. W.....	Grassy Creek.....	16	16
Cleveland, J. L.....	Paynes Depot.....	29	13
Corbin Bros.....	Nebo.....	13	3
Doolan, Esten.....	Finchville.....	18	4
Doolan, Ernest.....	do.....	15	3
Drane, H. H.....	Eminence.....	14	4
Frank, Ben T.....	Paducah.....	23	5
Gaines, P. B.....	Carrollton.....	21	1
George, J. E.....	Princeton.....	6	.....
Gibson, J. E.....	Somerset.....	28	14
Giltner Bros.....	Eminence.....	123	14
Gohlson, R. L.....	Kevil.....	6	22
Gottbrath, Frank.....	Westport.....	18	6
Graddy, W. Henry.....	Versailles.....	42	39
Graves Bros.....	Morganfield.....	8	8
Hanger, H. B., jr.....	Richmond.....	9	2
Henshaw, Marsh.....	Henshaw.....	43	10
Holt, B. B. & Ed.....	Central City.....	10	28
Hoover, Will.....	Nicholasville.....	55	7
Jacobs, H. J.....	Princeton.....	11	.....
Jacobs, J. W.....	do.....	13	.....
Knox, Dr. A. T.....	Thomson.....	35	5
Lile Bros.....	Leitchfield.....	53	4
McCabe, Eugene.....	do.....	10	.....
McConnell, P. H.....	Princeton.....	6	5
Quarrels, A. R.....	Hopkinsville.....	7	4
Railey, L. A.....	Versailles.....	33	13
Ramsey, J. K.....	Madisonville.....	8	12
Satterfield, F. T., Herd No. 1.....	Twin Springs.....	80	11
Satterfield, F. T., Herd No. 2.....	do.....	2	28
Smith, R. M.....	La Grange.....	12	6
Sputh, Phelps & Jackson.....	Eminence.....	56	14
Taylor, Col. E. H., jr., Hereford Farm.....	Versailles.....	309	78
Williams, J. C.....	Madisonville.....	12	6
MAINE.			
Adams, Stephen J.....	Cornish.....	14	.....
Bearce, H. W.....	Hebron.....	14	1
Cleveland, E. L., Co.....	Houlton.....	29	18
Durgin, W. F.....	West Buxton.....	7	7
Fisher, Harry N.....	Sabattus.....	8	6
French, C. A.....	Temple.....	7	3
Gilpatrick, Fred T.....	Cornish.....	2	8
Higgins, Wellington S.....	Monmouth.....	7	3
Jones, Ellston A.....	Sabattus.....	8	1
Moore, Ira H.....	Newfield.....	11	1
Norton, R. F.....	Kear Falls.....	4	6
Norton, Rupert S.....	do.....	14	.....
Pingree, Perley L.....	Denmark.....	6	16
Richardson, L. F.....	Norway.....	.....	11
Stuart, Cecil T.....	Cornish.....	9	4
Thomes, Robert S.....	Cumberland Center.....	23	.....

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MARYLAND.			
Coffman, John D.	Keedysville	7	4
Funkhouser, J. Albert.	Clear Spring	10	9
MASSACHUSETTS.			
Crane, Z. Marshall.	Windsor	47	101
MINNESOTA.			
Anderson, Victor	Butterfield.	8	2
Archer, C. H., & Son.	Ogilvie.	10	2
Bandas, Martin.	Brandon.	24	16
Bangasser, F.	Garvin.	60	5
Barber, A. E.	Granite Falls.	39	39
Brown, C. E.	Madelia.	32	2
Buck, A. E.	Butterfield.	14	9
Bullert, Chas.	Glencoe.	31	31
Butman, Roy E.	Pipestone.	15	18
Buttolph, Roy.	Spring Valley.	1	13
Cusick & Randall.	do.	42	10
Ericson, Clem.	Hartland.	5	1
Ferguson Bros.	Canby.	156	25
Franklin, Floyd.	Blue Earth.	32	8
Grange, W. H., & Son.	Warren.	10	4
Halland Bros.	Storden.	35	21
Hansen, Jas.	Russell.	9	10
Healy, O. W., & Son.	Mapleton.	93	11
Kemen, Jos.	Madison.	9	17
Kjos, T. E.	Rushford.	36	5
Kohn, J. F.	Luverne.	27	6
Lamp, G. B., & Son.	Mapleton.	27	3
Laurent, H. Omer.	Red Lake Falls.	15	15
Lingle, Jas.	Morgan.	12	2
Mahoney, L. A.	Stewartville.	5	3
Meyer, Andrew, & Son.	Fergus Falls.	28	6
Nash, C. D.	Tracy.	50	.....
Olson, Ale & Tolif.	Balaton.	1	19
Potter, A. A.	Windom.	6	15
Priebe, John.	Tyler.	5	20
Quiring, J. J.	Mountain Lake.	15	8
Sage, Homer.	Truman.	17	17
Stevens, D. G.	Edgerton.	44	8
Tegel Bros.	Marshall.	16	7
Tew, E. O.	Rushford.	15	17
Twetten, R. H.	Caledonia.	14	7
Whingelby, Peter.	Marchfield.	27	9
Wiener, J. H.	Hatfield.	13	7
Wood, W. H.	Stewartville.	22	3
Zachte, Henry G.	Lamberton.	11	9
Ziegler, Geo. F.	Holland.	56	20
Ziegler, O. H. & E. R.	Brookpark.	7	9
Zupp & Webber.	Blue Earth.	56	4
MISSISSIPPI.			
Alexander, C. B.	West.	23	.....
Beltzhoover, Estate of M. S.	Natchez.	54	.....
Buford, M. A.	Independence.	29	29
Davis, V. T.	Jackson.	33	9
Dawson, William.	Abbott.	9	16
Enochs & Wortman.	Jackson.	120	41
Holcombe, Bonnus.	Abbott.	8	8
Lee, J. L.	Collins.	9	1
Martin, W. F.	Grenada.	19	.....
McBeath, J. M.	Meridian.	14	4
Poplar Grove Stock Farm.	Natchez.	8	.....
Wilkins, W. P.	Holcombe.	31	.....
MISSOURI.			
Adkison, A. D.	Tebbetts.	12	4
Adkison, E. W.	do.	7
Alsop, A. J.	Pearl.	8	1
Baker, H. V.	Portland.	12	6

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MISSOURI—continued.			
Bayless, T. M., & Son.....	Cassville.....	9	4
Black, Samuel.....	Reeds.....	13	6
Bonne Terre Cattle Co.....	Bonne Terre.....	116	4
Brown, Dr. R. A.....	Stockton.....	46	4
Buchheit, B. A.....	Biehle.....	8	6
Bullington, Jacob L.....	Oak Hill.....	8	18
Cashion, P. A.....	Farmington.....	12	11
Cave, H. S.....	Wainwright.....	1	17
Cissell, L. V.....	Perryville.....	11	1
Collier, J. E.....	Owensville.....	21	24
Cotton, Robert H.....	Smithton.....	7	14
Cox, H. C.....	Monett.....	31	11
Davis, John.....	New Cambria.....	23	2
Eubank, P. B.....	Huntsville.....	43	6
Faherty, L. P.....	Perryville.....	40	.....
Farmer, J. R.....	Tebbetts.....	16	2
Farmer, S. A., & Son.....	Pearl.....	99	8
Forward, F. F.....	Huntsville.....	19	4
Freeman, Dr. and Mrs. L. D.....	Purdy.....	30	3
Gulick, J. F.....	Jasper.....	83	14
Hall, E. F.....	Tebbetts.....	16	4
Hall, W. H.....	Greenfield.....	12	6
Hall, L. V.....	Tebbetts.....	16	2
Harter, H. J.....	Weingarten.....	33	3
Hayward, Henry & H. H.....	Dadeville.....	8	2
Henry, Dr. S. D.....	Excelsior Springs.....	1	42
Hoppers, George M.....	Urbana.....	21	6
Hudson, Al, & Son.....	Fairview.....	11	5
Hughes, J. L.....	Bolivar.....	45	3
Jones, Guy.....	Bigelow.....	65	7
Kennel, J. F.....	Reeds.....	40	4
Kirby, B. B.....	Dadeville.....	4	36
Kirby, W. P.....	Huntsville.....	15	3
Kirksey, J. F., & Son.....	Larussell.....	22	22
Kurre, H. M.....	Millersville.....	11	8
Lee, Phil.....	Grandview.....	171	14
Luckhardt, L. H., & Son.....	Tarkio.....	63	9
McMurry, Miss Alta.....	Dadeville.....	29	2
Manning, C. A. & J. F.....	Cairo.....	25	15
Martin, W. W.....	Doniphan.....	21	4
Metcalf, Frank.....	Stockton.....	22	12
Pickering Farm.....	Belton.....	888	3
Pinet, L.....	Tebbetts.....	31	5
Rees, John.....	New Cambria.....	50	2
Simpson, James A.....	Oak Hill.....	28	9
Tschudy, J. H.....	Kansas City.....	56	3
Urban, W. E.....	Perryville.....	48	12
Vessells, Dr. F. M.....	do.....	17	16
Vessells, J. J.....	do.....	32	5
Vickers, C. A.....	Lebanon.....	43	3
Viles, C. W.....	Bolivar.....	34	.....
Webber, O. H., & Co.....	Yarrow.....	45	32
Wehrman, Louis.....	Hawk Point.....	84	3
Weimer, C. C., & Son.....	Farmington.....	36	5
Wilson, Dr. A. E.....	Brighton.....	16	3
Yarnall, T. B., & Son.....	Cassville.....	40	12
MONTANA.			
Cook, A. B.....	Townsend.....	262	116
Haley, C. W.....	Terry.....	37	6
Hastings & Hoover.....	Philipsburg.....	87	147
Hunter, Dwight L.....	Dooley.....	19	5
Lamb, H. A.....	Helena.....	32	5
McGlynn, A. J.....	Kalispell.....	39	2
McVay, A. B.....	Great Falls.....	52	14
Millard, C. J.....	Westmore.....	35	1
Miles, J. D.....	Wilsall.....	76	64
Velie, W. L.....	Highwood.....	17	.....
Waldron, Clement L.....	Carlyle.....	32	.....
Wilcomb & Moe.....	Twin Bridges.....	9	62

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NEBRASKA			
Cather, F. W.	Bladen	15	5
Darwin, H. E.	Virginia	23	6
Gergen, N.	Geneva	22	8
Kort, Chas.	Blue Hill	24	
McConnell, D. E.	Holbrook	48	12
Mendenhall, T. E.	Fairbury	44	23
Mercer, B. F.	Ainsworth	70	
Ralston, C. A.	Johnstown	87	5
Satterfield, F. R.	Taylor	171	12
Taylor, F. J.	Harmony	41	23
NEVADA.			
Cazier, John H., & Sons.	Wells	362	
DeBernardi, R.	Reno, box 8033	11	2
Springmeyer, H. H., Land & Livestock Co.	Minden		38
University of Nevada, Animal Husbandry Department.	Reno	32	
NORTH CAROLINA.			
McClure, J. G.	Fairview	7	42
Moore Stock Farm	New Bern	1	59
Newell, W. B.	Newell	13	17
Sanford & Rich.	Mocksville		28
Young, Jno. A., & Sons	Greensboro	15	7
NORTH DAKOTA.			
Adams, Charles.	Killdeer	12	
Affelett, Julius.	Hamberg	28	
Anderson, Nels.	Marion	22	6
Bailey, R. J.	Wishek		10
Brown, Aug.	Sheldon	1	11
Brown, John C.	Forbes	11	
Brunsvold, A. N.	Edinburg	16	17
Christianson, Nils.	Rolette	15	
Cook, W. M.	Bowdon	26	30
Dahl Bros.	Grafton	8	19
Dobias, Joseph.	Cartwright	10	
Ellingson, G. E.	Maddock	16	1
Fisher, Paddy.	Bantry		13
Flisram, Lawrence.	Hankinson		15
Fosside, M. J.	Edinburg		15
Fosside, Ole.	Milton		17
Gunkel, Carl.	Belfield	58	13
Haas, W. H.	Forbes	8	5
Hartman, Henry J.	Hamar	1	41
Healy, Wm.	Glenburn	5	
Hegney, T. G.	McClusky	3	26
House, H. W.	Solen	12	8
Jorgenson, Hans K.	Flasher		18
Jorstad, T. T.	Harvey	1	10
Kennire, J. W. A.	Emerado	15	
Lagerberg, Nels.	McGregor		22
LaPort Cattle Co.	Newburg	16	
Lemieux, Peter.	Rolette	8	
Lippert, F. C.	Sarles	7	
Livingston, Gerald.	Bowman	19	
McCullough, W. J.	Greene	5	10
Miller, R.	Bismarck	23	
Miller, S. N.	Benedict	8	11
Mills, Geo. W.	Hannaaford	39	8
Mills, J. G., & Sons.	do.	8	5
Mills, Milton E.	do.	30	5
Monroe & Bigham.	Haynes	10	
Nehring, A. E.	Williston	6	
Nelson, Nels.	Amenia		13
Oakley, F. B.	Edgeley	5	6
Olson, C. J.	Michigan		12
Olson, Ed. W.	Rolette	19	1
Palm, John.	Cummings		11
Payseno, Geo.	Denhoff	1	18

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Peterson, M. P.	Hettinger	7	3
Peterson, O. P.	Grace City	30	15
Prince, Henry	Columbus	12	
Puppe, Fred.	Hensel	5	8
Radabaugh, C. H.	Grandin	1	14
Rayl, John P.	Oakes	16	6
Redlin, O. C.	Crosby	28	34
Royland Patterson	Oakes	26	
Rutherford, J. H.	Grafton	6	6
Schroeder, C. J.	McGregor		19
Seim, Krist.	Edinburg		10
Spitzer, S. H.	Edgeley	61	171
Stone, J. E., & Sons	Powers Lake	39	7
Sutherland, W.	Bordulac	17	1
Thoburn, W. A.	Wyndmere	24	5
Tiegan, O.	Brocket		11
Titus & Bagley	Medora	45	
Tofsrud, O. T.	Rugby	5	9
Twetten, Arthur	Rolette	19	
Walla, Jens G.	Arnegard	10	8
Wheeler, D. U.	Solen		48
Wells, Alson	Jamestown	10	
Wichmann, F. A.	Leonard	14	2
Wieg, A. C.	Sheldon	3	41
Willows, Geo.	Edmunds	3	32
Wilson, M. A.	Earl	42	1
Wing, O. B.	Wilton	53	88
OHIO.			
Grinnell, Morton	Yellow Springs	30	4
Lyons, H. S.	Chandlersville	4	10
Spragg, Delbert F.	Adena	10	2
Titus, George V.	Middleport		15
OKLAHOMA.			
A. & M. College	Stillwater	31	
Henderson, A. J.	Cherokee	23	10
Leahy, W. T., & Son	Pawhuska	30	4
OREGON.			
Emery, William P.	Macleay	33	
SOUTH CAROLINA.			
Boykin, B. H., jr.	Boykin		34
Britt, J. E.	McCormick		30
Cade, G. W.	Bordeaux	5	57
Copeland, J. M.	Renno	3	17
Kennedy, J. L.	Troy	8	50
Rush, F. P.	Bradley	1	25
Stockman, J. P.	Greenwood	15	8
SOUTH DAKOTA.			
Greenwald, B. T.	Edson	29	
Henricks, Geo.	Watertown		30
Jellesma, Chas.	Athboy		17
Mason, Geo. W.	White Lake	118	8
McCarthy, Albert	De Smet	25	7
TENNESSEE.			
Adams, James	Chattanooga		12
Blake, Rodney	Cumberland City	14	6
Bradford, W. I., & Son	Humboldt	16	16
Brittain, J. W.	Smyrna	24	2
Cayce, H. F.	Columbia	25	3
Harris, Mrs. T. W.	Cumberland Furnace	15	
Hopper, W. D.	Rutherford	33	1
McClanahan, V. A.	Hampshire	42	
Meacham, J. H.	Franklin	23	6
Thatch, T. E.	Harrison	14	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
TEXAS.			
Colbert, R. C., & Son.....	Stamford.....	169	28
Ikard, W. S.....	Henrietta.....	9	
Kothman, E. O.....	Mason.....	61	
UTAH.			
Livingston Stock Farm Company.....	Farmington.....	35	3
Nelson, Jos. A.....	Ephraim.....	10	
Olsen, Jas.....	do.....	55	11
VERMONT.			
Putnam, E. E.....	West Newbury.....		18
Webb, J. Watson.....	Shelburne.....	30	23
White, E. H.....	East Corinth.....	20	2
VIRGINIA.			
Allen, W. P.....	Gibson Station.....	9	5
Barclay, R. C.....	Warrenton.....	16	22
Bryant, I. B.....	Independence.....	54	
Cameron Bros.....	Gordonsville.....	17	13
Gilly, James E.....	Olinger.....	26	8
Lunsford, J., & Sons.....	Monterey.....	11	2
Mitchell, W. H.....	Rye Cove.....	40	5
Musick, J. T.....	Pennington Gap, R. 5.....	52	6
Reasor, J. J.....	Olinger.....	9	13
Russell, J. H.....	Pennington Gap.....	10	4
Witt, C. E.....	do.....	13	
Woodard, J. O.....	Jonesville.....	8	5
WASHINGTON.			
Monnett, A. A.....	Dayton.....	11	
WEST VIRGINIA.			
Brand, W. E.....	Morgantown.....	11	3
Chambers, C. B.....	Ravenswood.....	6	8
Core, Charles E.....	Cassville.....	2	7
Irons, C. F.....	Pickaway.....		21
Nixon, R. S.....	Shinnston.....	20	14
Poling, A.....	Buckhannon.....	4	20
Smith, C. A.....	Chester.....	33	1
Wright, James E.....	Burlington.....	13	6
WISCONSIN.			
Foster, G. A.....	Fairchild.....	27	7
Hyde, S. Y.....	La Crosse.....	19	0
Melville, Frank.....	Chippewa Falls.....	19	2
Total, Hereford, United States.....		12,958	6,029

POOLED HEREFORD.

ILLINOIS.			
Adair, Henry	Stronghurst	96	7
Bruninga, M. H.	Macomb	12	2
Cutler, P. W.	Carthage	76	6
Fort Bros.	do.	6	20
Johnson, Frank J.	Stronghurst	43	7
Moyer, E. W.	Earlville	25	2
Naffziger, H. P.	Walnut	66	6
Negley, A. L.	Stronghurst	14	5
Nelson, Anton.	do.	7	5
Oakford, E. E.	Walnut	30	2
Rudiger, Chas. H.	Spring Valley	9	15
Park Roy	Media	33	4
Porter, Geo.	Bushnell	6	4
Penny, P. B.	Lomax	15	9
Schweizer, Lewis	Blandinsville	2	6
Walton, Ed.	Bowen	50	2
Yaley, A. C.	Media	60	11

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

POLLED HEREFORD—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
INDIANA.			
Green, J. E.....	Muncie.....	85	6
IOWA.			
Appenzeller, Frank.....	Bouton.....	10	4
Galbraith, Robert.....	What Cheer.....	46	2
Johnson, Oscar W.....	Manson.....	20	3
Kirstein, F. L.....	Clarion.....	13	.....
Meyer, August.....	West Liberty.....	31	5
Meyer, Emil.....	Lone Tree.....	26	3
Roth & Dodson.....	Ocheyedan.....	58	6
Schnoor, Henry.....	Perry.....	52	4
Schooley, H. L.....	West Liberty.....	13	4
Stafford, James.....	do.....	15	4
Stewart, J. E.....	Grinnell.....	53	5
Wiese, John D.....	Manson.....	10	10
MISSOURI.			
Fields, R. M., & Clore.....	Lees Summit.....	37	5
Hill, J. R.....	Norborne.....	16	5
NEBRASKA.			
Hoffman, J. F.....	Dorchester.....	19	9
Welty, J. S., & Son.....	Gresham.....	16	1
SOUTH DAKOTA.			
Eddy, D. O.....	Wessington Springs.....	46	5
Total (Polled Hereford, United States).		1,116	194

RED POLLED.

ARKANSAS.			
Bellamy, Edward C.....	Mammoth Springs.....	15	.....
Kizer, John R.....	Pocahontas.....	22	.....
FLORIDA.			
Pace Turpentine Co.....	Jay.....	.....	35
IDAHO.			
Beeman, F. A., & W. H.....	New Plymouth.....	.....	12
Ewing, R. E.....	Emmett.....	8	10
Iller, Alfred.....	St. Maries.....	.....	29
ILLINOIS.			
Bennett, Roy E.....	Chatsworth.....	16	4
Larabee, J. W.....	Earlville.....	66	.....
Miller, Otto C.....	Loami.....	9	1
Pope, Hugh K.....	Yorkville.....	17	.....
INDIANA.			
Hauntz, Frank C.....	Moore's Hill.....	.....	14
Pritchard, Lewis.....	do.....	.....	18
Whiteford, Clarence.....	do.....	.....	12
IOWA.			
Clouse & Angell.....	Manson.....	58	.....
Hawk, A. A.....	Mabel, Minn.....	27	1
KANSAS.			
Foster, C. E.....	Eldorado.....	28	.....
Haag, A. H.....	Holton.....	19	.....

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

RED POLLED—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
KENTUCKY.			
Kennedy, W. L.	Lola	13	2
Kimbro, T. J.	Fulton	8	5
MINNESOTA.			
Anderson, Jens	Lake Benton	6	8
Aultfather, D. C.	Austin	18	5
Christensen, W.	Thief River Falls	2	11
Daschner, Geo.	Madison Lake	4	13
Ellis, James	Clearbrook	2	8
Gillingham, Fred	Granite Falls	18	1
Haugen, Knute	Goodridge	9	13
Haugen, Oscar	St. Hilaire	13	13
Hoehn, Frank	Madison Lake	3	7
Johansen, Jorgen, & Son	Tyler	49	13
Johnson, August	Thief River Falls		10
Larson, L. D.	Clearbrook		10
Lindberg, Victor & Anton	Leonard		10
Maakned, John	St. Hilaire	1	15
Monson, Andrew	Leonard		19
Nelson, R. F.	Farmington	13	33
Novak, W.	Red Lake Falls	11	30
Rybak & Rech	New Prague	45	1
Stenehjelm, J. S.	Spring Grove	5	14
Tallerday, W. L.	Remer	8	7
MISSISSIPPI.			
Shakelford, J. W.	Myrtle	10	2
Speed, J. D.	Collins	3	5
MISSOURI.			
Alford, A. M.	Fulton	6	
Andrew, James	Marshfield		19
Brownlee, R. C.	Holden	31	3
Morse Stock Farm	Neosho	41	8
Murta, P. J.	Cuba	7	7
Preston, D. C.	Seymour	38	3
Preston, J. C.	do	18	
Simpson, O. F.	Hamilton	8	7
Zachman, Mrs. Stella D.	Oregon	33	
NEBRASKA.			
Anderson, Adolph	Davenport	50	
Brabham, J. H.	Bradshaw	29	
Brehm, C. W.	Harvard	22	4
Brondel, Theo.	Bradshaw	5	4
Buschow, F. C., & Sons	Blue Hill	35	
Cather, G. P.	Bladen		13
Christiansen, L. M.	Plainview	91	
Davis, Frank, & Sons	Holbrook	15	
Davis, J. P.	Geneva	31	
Graff, R. V.	Bancroft	27	
Larson, Paul C., & Son	Wolbach	24	2
Simonson, A. P.	Verona		10
Slayton, L. W.	Salem	13	2
Walker, Robert	Clay Center	22	2
Watson, L. & F.	Ord	7	16
Yost, W. J.	Harvard	3	10
Zimmerman, J. G.	De Witt		17
NORTH CAROLINA.			
Reynolds Lybrook Farms Co., Arston Farm.	Winston-Salem		41
Reynolds Lybrook Farms Co., Brenmoda Farm.	do		37
Yarbrough, W. H.	do	1	10

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

RED POLLED—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA.			
Agre, H. O.	Columbus.		13
Bantel, W. W.	Lucca.		11
Bassford, Earl.	Warwick.	1	17
Bixby, J. S.	Lisbon.	114	1
Borseth, O. J.	Enloe.	6	11
Brastrup, Geo. E.	Courtenay.	3	10
Canutson, H. H.	Reynolds.	3	19
Capener, Howard H.	Erie.	38	2
Cavett, Chas.	Enderlin.	33	1
Donnelly, J. A.	Oakes.	5	15
Edwards, A.	Bisbee.		17
Ford & Son.	New Rockford.	6	20
Gallagher, Mike.	Agate.		19
Gibson, Nat.	Manning.		13
Greger, Carl.	Bordulac.		11
Hendrickson, T. A.	Bisbee.		14
Holler, John.	Bowesmont.	15	
Johnson, David R.	Fullerton.	13	
Johnson, Edward.	St. John.	5	19
Johnson, John K.	Mountain.	9	17
McMillan, T. E.	Wimbleton.	1	15
Murray, E. E.	Sentinel Butte.	16	1
Reise, Herman.	Oakes.	10	
Schafer, George.	McClusky.	4	11
Solberg, Owen.	Agate.		19
Stary, John V.	Conway.	8	17
Steinolfson, T. H.	Mountain.		12
Swanson, D. W.	New Rockford.	1	13
Tucker, H. N.	Courtenay.	36	2
Walstad, T. L.	Milton.		12
OHIO.			
Etzler, Christ.	Convoy.	31	
Evans & Son, R. O.	Venedocia.	9	3
James, Henderson.	Barnesville.		26
Kroft, E. M.	Mt. Perry.	12	
PENNSYLVANIA.			
Dickson, J. C., & Sons.	Cochrannton, R. 4.	24	
SOUTH CAROLINA.			
Brooks, E. L.	Dyson.	13	14
Davies, T. W.	Augusta, Ga., R. 3.		14
Dyches, H. P.	Aiken.		26
Summerall, F.	do.		14
SOUTH DAKOTA.			
Brewer, W. E.	Zell.	24	
Hublou, E. J.	Milbank.	6	
Kloster, Lars L.	Clark.	11	3
Peter, Walter P.	Rockham.	2	13
Walters, W. F.	Watertown.	8	14
VIRGINIA.			
Nicoll, Henry.	Pennington Gap.	34	
Rutherfordord, J. T.	Rock Castle.	13	
WISCONSIN.			
Gorman, C., Farm No. 1.	Viroqua.	3	29
Gorman, C., Farm No. 2.	do.		13
Kimball, Nat.	Black River Falls.	12	16
Salter, J. W., & Son.	Unity.	41	
Thompson, L. M.	Viroqua.	11	2
Total (Red Polled, United States).		1,651	1,115

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
ALABAMA.			
Cope, E. H.	Union Springs, R. 1.	26	..
Houston, W. G., & Lanort, G. A.	Tuscumbia, R. 1.		20
Solomon & Oates	Headland		48
ARKANSAS.			
Trustee, A. H. Endowment	Jonesboro	21	..
Bleakley, F. L.	Newport	23	..
Bogart, R. D.	Prairie Grove	6	4
Counts, G. D.	Wesley	14	5
Cosby & Son, W. C.	Baldwin	8	..
Crowder, Culver	Bentonville	8	..
Eldridge, Jno. D.	Gregory	14	11
Flanagan, W. E.	Charleston	24	2
Homeyer, Henry	Fayetteville	15	13
Johnston, G. H.	do.	27	6
Lee Brothers	Pea Ridge	12	7
Magness, H. R.	Western Grove	6	..
Owenby, C. A.	Springdale	15	..
Sloan, M. F., Jr.	Noland	39	6
Stokenberry & Son, R. H.	Elkins	10	..
University of Arkansas	Fayetteville	5	14
Williams & Mathis	West Fork	6	3
CONNECTICUT.			
Gilbert Farm	Georgetown	20	27
FLORIDA.			
Bates, L. E.	Tampa	3	41
Gist, W. M.	Ocala		22
GEORGIA.			
Stallings, George T.	Haddock	46	26
State College of Agriculture	Athens	15	..
Trimble, W. W.	Adairsville	6	..
IDAHO.			
Adams, Jesse	Idaho Falls	30	1
Armes, P. S.	Filer	6	5
Andregg, H. F.	Eagle		13
Armfield, Elmer	Caldwell	2	10
Brammer, Henry	Lewisville		11
Barston, M. D.	Buhl	10	3
Bingham, G. C.	Filer	5	4
Bow, S. F.	Caldwell	8	26
Beamer, D. T.	Filer	2	4
Byrne, Lewis	Sunnydell		27
Byrne, James	do.	1	36
Bunn Bros.	Lanark	3	4
Brown, E. E.	Montpelier	1	23
Beck, Henry	Caldwell	21	..
Brown, W. C.	Castleford	18	2
Beck, J. O.	Boise	11	5
Branson, F. B.	Filer	6	..
Buchanan, D. B.	St. Maries		30
Bird, Jas. T.	St. Anthony	8	6
Ball & Anderson	Hansen	3	11
Caldwell, F. E.	Caldwell	3	3
Cleveland & Warren	Boise	21	..
Clint, John	St. Maries		26
Chase, Charles	St. Anthony		13
Craner, W. W.	Buhl	4	8
Craig, T. C.	Idaho		27
Clarke, M. C.	Menan		13
Dodgins, Jas.	Eagle	7	2
Dorman, H. M.	Caldwell	16	1
Ellis, F. G.	Rigby	1	12
Fellhouse, N. S.	New Plymouth	6	5
Fest, H. L.	Emmett	6	2
Finn, W. H.	Rigby		25
Galloway, Guy	Weiser	21	25
Gammon, Lillian R.	Caldwell	6	..
Grim, E. O.	do.	36	1
Grim, C. B.	Nampa	20	14

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
IDAHO—continued.			
Giese, Julius.....	Julianta.....	4	11
Gregory, G. F.....	Idaho Falls.....		10
Gooding, F. W., & Sons.....	Shoshone.....		35
Gooding, Fred.....	do.....		14
Gage, E. R.....	Dietrich.....	1	14
Harrod, G. A.....	Winchester.....		19
Hill, Jno.....	Payette.....	24	7
Harman, John.....	Caldwell.....		14
Hammar, C. W.....	do.....	1	13
Handysell, R. A.....	do.....	1	15
Hazzard, Wm. C.....	Buhl.....	1	31
Hanbon, J. W.....	Caldwell.....	3	6
Hatfield, W. R.....	Buhl.....	7	17
Johnson, J.....	Rexburg.....	1	25
Jacot, J.....	St. Maries.....	1	56
Jacot, Robert.....	do.....	1	41
Jarvis, Bert.....	Bloomington.....	3	9
Krogne, D. A.....	Montpelier.....	1	12
Leland Bros.....	Wendell.....	6	
Looney, Eugene.....	Cambridge.....	50	5
Larson, A. S.....	St. Maries.....		14
Larson, Albert.....	do.....		12
Lyons, E. J.....	Filer.....	3	5
Leister, A. S.....	Winchester.....		10
Logg, J. L.....	Nampa.....		28
McMillan, Geo. F.....	Winchester.....		18
McMillan, G. A.....	do.....	1	13
McFarlane, A. C.....	St. Anthony.....		10
McCoy, B. A.....	Filer.....	4	3
McClung, A. W.....	Caldwell.....	4	1
Myers, Chris.....	Weiser.....	10	
Mase, C. H.....	Cocolalla.....		39
Morgan, W. R.....	Liberty.....		13
Morgan, Hugh.....	do.....		13
Musgrave & Sons.....	Filer.....	3	5
Morrison, Wm.....	Murtaugh.....	5	18
Myers, Mrs. D. B.....	Caldwell.....		32
Maxwell, J. E.....	Wendell.....	8	6
Mathis, Frank J.....	Dietrich.....		38
Madalena, A. G.....	Buhl.....		23
Mitchell, Walter B.....	Parma.....		17
Nordby, Oscar.....	Genesee.....	5	2
Nesbitt, M. S.....	New Plymouth.....	10	
Parker, Henry.....	Lanark.....		11
Parker, Oscar.....	do.....		28
Proctor, S. H.....	Kimberly.....	4	2
Pollard, Harry.....	Starr.....		23
Pierce, J. M.....	Berger.....	6	12
Roberts, Owen.....	Lanark.....		13
Requa Bros.....	Kimberly.....	17	3
Rockwood, J. A.....	Roswell.....	9	3
Schooler, J. G.....	Buhl.....		12
Syster, O. E.....	do.....	32	17
Steiner, Geo.....	Rexburg.....		12
Sleight, R. S.....	Paris.....	3	16
Stratford, D. M.....	Caldwell.....	6	42
Stevens, R. J.....	Winchester.....		13
Teichert, Julius.....	Sterling.....		18
Tish, Geo. P.....	Caldwell.....	5	6
Thomas & Hodges.....	do.....	5	
Ticknor, E. C.....	Filer.....	6	4
Tuckett, C. N.....	Rexburg.....		11
Tefft, B. W.....	Ido.....	3	9
Thornton, R. G.....	Payette.....	2	15
Uhlig, Charles.....	Churchill.....	24	4
White, Robert M.....	Caldwell.....	20	1
Warner, T. A.....	Buhl.....	16	9
Ward, Abram.....	Rigby.....		18
Warner, L. A.....	Buhl.....	16	28
Wing, Fred.....	Caldwell.....	20	11
Weeks, John.....	Sunnydell.....		19
Wallantime, C. A.....	Lanark.....		24
Webb, Elton.....	New Plymouth.....	83	1
Williamson, N.....	Moscow.....	38	
Ywager, Geo.....	Payette.....	30	3

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
ILLINOIS.			
Ackerman, J. H.	Morton.	21	6
Ackerman, C. W.	do.	22	5
Allison, H. C.	Lerna.	18	7
Anderson, C. S.	Ohio.	17	7
Artman, A. G.	Elizabeth.	42	4
Asher, Chas.	Paris.	12	4
Bates, C. G.	Cameron.	7	1
Bauman, Carl.	Morton.	9	4
Baumgartner, T. E.	Chatham.	7	2
Betzlberger, John & Son.	Delavan.	7	6
Birky, Chris.	do.	18	3
Billerbeck, August.	Cullom.	10	4
Boyer, T. A.	Lena.	7	5
Brechtel, Carl.	Waddams Grove.	19	7
Brechtel, Frank H.	do.	7	7
Brechtel, Wilbur.	do.	3	18
Brown, Jas.	Dundee.	23	
Brown, C. D. & H. S.	Ridge Farm.	11	3
Buck, A. E.	Mazon.	9	8
Burkey, Lee H.	Walnut.	7	2
Callery, Frank A.	Edelstein.	14	4
Carmichael, Philip.	Stanford.	5	
Challand, Henry.	Waterman.	6	5
Chandler, Fred.	Carman.	4	4
Clair, Galen B.	Kent.	10	2
Cline, Frank.	Clinton.	6	9
Cox & Largent.	Tremont.	23	4
Diemer, W. W.	Dakota.	7	18
Dixon, W. H.	Carlock.	28	
Dye, R. L.	Dieterich.	7	11
Ebner, R. E.	Tonica.	9	
Egan Bros.	Wenona.	8	8
Evans, C. H.	Mason.	3	
Fasse, Homer.	Minier.	21	3
Frank, J. W.	Morton.	14	4
Genung, Arthur.	Port Byron.	15	15
Getz, Benjamin.	Tremont.	7	13
Griffin, G. F.	Lostant.	11	2
Grimes, Geo. F.	Charleston.	11	3
Gut, Joseph D.	Hopedale.	7	5
Guth, Peter.	Morton.	7	6
Hartke, J. L.	Dieterich.	17	1
Hanna, W. R.	Paris.	19	2
Hauter, Joseph.	Morton.	5	
Hazzard, Schuyler.	Ridge Farm.	21	
Henn, Philip A.	Redmon.	18	
Henderson, J. A.	Danvers.	5	2
Highberger, D. & Son.	German Valley.	11	1
Hirsten, A. B.	Cullom.	26	2
Hodel, Geo.	Metamora.	14	1
Hoffman, Philip.	Tremont.	9	1
Hunt, E. R.	Winnebago.	11	4
Imig, Gus.	Minier.	19	5
Jamison, Ray.	Ottawa.	15	5
Jones, Ebon C.	Bloomington.	9	
Lafferty, Ira.	Dewitt.	37	5
Langford, Fred.	Paris.	8	8
Lant, C. E.	Gladstone.	7	3
Lincoln, Thos.	Ridott.	24	1
McVay, J. I.	Cornell.	9	35
Mann, Chas.	Beecher City.	14	12
Martin, Harry.	Brocton.	18	7
Mecherle, Willis.	Bloomington.	2	3
Miller, H. J.	Mendota.	25	4
Moody, Edward.	Dalton City.	6	18
Niblo, T. R.	Rock City.	11	16
O'Donnell, Edward.	Ottawa.	5	27
Ozee, Geo. D.	Lerna.	13	
Pickens, C. L.	Dieterich.	20	1
Pobanz, Frank.	Geneseo.	3	2
Price, E. L.	Muncie.	13	2
Quinn, J. J.	Streator.	15	
Railsback, Fay D.	Mackinaw.	13	5
Reitz, A. P.	Hoopeston.	9	9

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
ILLINOIS—continued.			
Reitz, Frank.....	Hoopeston.....	6	2
Roach, J. R.....	La Salle.....	2	8
Roth, Alvin.....	Morton.....	21	4
Roth Bros.....	do.....	22	3
St. John, W. S.....	Cornell.....	4	10
Schertz, Edward R.....	Metamora.....	6	7
Schertz, J. W.....	Roanoke.....	29	8
Scholl, Chas.....	Arrowsmith.....	23	4
Scholl, John.....	do.....	22	1
Schwarzenhaub, J. K.....	Princeton.....	20	3
Schwigert, J. C.....	Tremont.....	11	8
Scott, Fred.....	Wapella.....	14	5
Sheedy, John.....	Ransom.....	6	2
Simpson, C. R.....	Downs.....	26	2
Smith, John M., & Son.....	Ohio.....	10	5
Smith, Lawrence.....	Metomara.....	3	5
Smith, W. M.....	Odell.....	8	3
Sommer, Geo. I.....	Metamora.....	7	19
Stegar, John.....	Wheeler.....	9	.....
Stromer, Theo.....	Eureka.....	17	3
Thorp, Geo. H.....	Wapella.....	11	14
Tarman, Grant.....	Millford.....	4	1
Weaver, H. E.....	Dakota.....	17	.....
Welk Bros.....	Morton.....	8	2
Weller, A. J.....	Princeton.....	21	4
Wilson, Cecil.....	Argenta.....	9	5
Wilson, J. C.....	Dewitt.....	11	.....
Wilson, Ira.....	Wapella.....	22	3
Winsor Bros.....	Morris.....	20	1
Wood, Frank J.....	Mason.....	8	9
Wright, Mrs. Addell.....	Vermilion.....	10	2
Zipse, Wm.....	Winslow.....	19	4
INDIANA.			
Allison's Sons, W. A.....	Washington.....	16	11
Applegate, C. W.....	Hebron.....	37	1
Bowers, A. M.....	Marshall.....	16	3
Bowser, H. G.....	Fort Wayne.....	6	2
Bradley, Peter J.....	Logoootee.....	1	14
Brookover, Guy L.....	Bippus.....	17	5
Bruce, Amor L.....	Aurora.....	.....	16
Brutus, Arba.....	Pine Village.....	12	3
Butler & Butler.....	Marshall.....	17	4
Carson, Spencer.....	Monticello.....	15	6
Clay County Poor Farm.....	Centerpoint.....	1	11
Colvert & Son, A. L.....	Boswell.....	7	4
Constable & Son, C. L.....	Goodland.....	39	6
Creek, Ora B.....	Kitchel.....	6	8
Daily, Thomas.....	Fowler.....	8	4
Deer, E. L.....	Bargersville.....	7	7
Eberly, Arthur.....	Independence.....	15	6
Fisher, Clarence.....	Valparaiso.....	13	6
Friedersdorf, L. J.....	Eliza bethtown.....	25	.....
Funkhouser & Son, Wm.....	Rockfield.....	19	.....
Gerig, E. E.....	Auburn.....	5	10
Gerig, Noah M. V.....	do.....	5	20
Hadley, William.....	Bloomington.....	9	2
Heathman, Homer.....	Oakland City.....	8	1
Heiser, J. D.....	Culver.....	8	7
Heiser, R. H.....	do.....	6	.....
Heiser, W. G.....	do.....	5	4
Hess, George A.....	Pine Village.....	26	7
Hutton, S. C.....	Valparaiso.....	20	4
Jessup, Fred E.....	Rockville.....	6	2
Johnson, Will.....	Fort Wayne.....	8	1
Knickerbocker, Luke.....	Logansport.....	5	11
Kyle, H. W.....	Lawrenceburg.....	8	7
Lochery, H. E.....	Franklin.....	13	3
Mackey, Elmer.....	Hebron.....	6	2
Martindale & Allford.....	Wilkinson.....	6	1
Mead, James O.....	Goodland.....	8	4
Metzinger, M. G.....	Ambia.....	5	4
Million, William A.....	Monticello.....	5	3

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
INDIANA—continued.			
Morris, Frank T.	Logansport	16	
Nicodemus, Bert	do.	12	2
North, C. J.	Brookston	9	9
Pierce & Son, Ed.	Newcastle	11	4
Pound, W. H.	Sullivan	15	4
Reiff, Milt K.	Burnetts Creek	20	2
Rhode, Andrew	Pine Village	34	4
Rosenbaum, Jacob	Mount Vernon	11	4
Ross, John B.	Fort Wayne	9	3
Runner & Staggs	Oxford	1	13
Scheetz, John B., jr.	Grass Creek	23	2
Schiele, R. J.	Clay City	2	10
Sears, Virgil	Lapel	5	1
Shepard, George	Goodland	18	4
Shonkwiler, Harry L.	Raub	9	3
Smith, Norval	Kouts	23	2
Smith, W. O.	Oxford	20	7
Smith & George	Franklin	7	5
Steinmetz, A. F.	Ambia	64	3
Summers, J. M.	Oakland City	8	11
Thatcher, Glen	Valparaiso	5	4
Thiel, Milton	Hebron	6	
Thomas & Sons, W. H.	Farmersburg	12	8
Weis, Martin	Aurora		12
Willen, Christ A.	Clay City		10
Williams, Zeno	Bloomingsdale	17	3
Wortley, W. H.	Rensselaer	24	
IOWA.			
Anderson, W. C.	Norwalk	8	
Asmus, L. H.	Thompson		18
Austin, T. E.	do.		17
Austinson, M. S.	Forest City		16
Bakken, Chris.	do.		19
Bare, G. W.	Walker	25	5
Barthelme, Phil. & Son	Decorah	38	
Bell, Adam	Thompson		21
Bell, H. F.	West Bend	1	13
Bowman, M. L.	Waterloo		12
Brenneman, John C.	Kalona		26
Brenneman, M. J.	Kalona, R. 2		11
Brenneman, W. D.	Wellman, R. 3	8	23
Brown, F. E.	Mitchellville	42	4
Bruhns, Ferrus	Buffalo Center		10
Bruhns, Henry	do.		10
Cameron, W. A.	Lonerock	22	1
Carolan, Philip	Decorah	34	
Chalupa, Frank	Pleasant Plain	8	3
Charleson, I. W.	Forest City		16
Christenson, Will.	Armstrong		32
Clark, F. A.	Laurens	21	
Clausen, Peter	Spencer	38	
Corporation of Thompson.	Thompson		19
Cutler, Eugene	Logan	19	3
Dahl, Albert	Thompson		21
Dahlhouser, Peter J.	Whitemore		17
Dahlhouser, P. W.	do.	5	34
Dalton, E. R.	Algona		14
Dixon, O. A.	Waukon	1	60
Dresser, Paul	Cedar Falls	18	
Eggert, George	Newton	43	3
Ellefson, Ole	Leland		17
Elsen, Charles	Manson	20	
Engelbreton, John	Thompson	1	26
Erb, John	Wellman		1
Erb, Marion	Kalona		16
Erickson, Henry	Thompson		14
Ewen, C. E.	Callender	11	
Finer, E. S.	Thompson	2	15
Floyd County Farm.	Charles City	16	13
Frank, L. W.	Thompson		10
Gall, W. H.	Polk City		13
Genrich, A. M.	Luverne	13	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
IOWA—continued.			
Gillespie, H. L. F.	Manchester.	3	17
Gingerich, Jeff G.	Kalona.		15
Gingerich, John.	do.		10
Gingerich, L. O.	do.		15
Gingerich, W. F.	do.	10	2
Gjertson, John.	Woden.		41
Grotenhuis, A. J., & Son.	Sioux Center.	43	4
Gunderson, G. K.	Thompson.		14
Hague & Gifton.	Fairfield.	14	7
Hancher, A. E.	Plover.	17	1
Hanna & Griffith.	Ankeny.	20	
Hanson, Julius.	Wesley.		15
Harrison, Mrs. W. L.	Algona.		10
Hanfbauer, J.	Buffalo Center.	1	13
Healy, O. M., & Son.	Muscatine.	41	
Hehir, John.	Harpers Ferry.	7	5
Helgren, John.	Thompson.		24
Henderson, C. P.	Murray.	1	11
Hermanson, A. T.	Forest City.	9	23
Holland, O. H.	Thompson.	1	20
Hoover, C. E., & Son.	Delphos.	26	4
Hulme, George.	Woden.		24
Iowa State College.	Ames.	23	
Jacobs, Hans.	Thompson.		28
Jennings, Dr. H. B.	Council Bluffs.	33	
Jensen, J. E.	Buffalo Center.		14
Kossuth County Farm.	Algona.	1	33
Lehman, C. H.	Thompson.		20
Lofstadt Brothers.	Rippey.	18	2
Luckason, Arne.	Kensett.	92	7
Lyders, A. M.	Ellsworth.	40	1
McKibben, J. E.	Mechanicsville.		10
Martin, Edward.	Parnell.		17
Metz, F. E.	Fairfield.	25	
Miller, C. D.	Wellman.		14
Miller, David D.	Kalona.		13
Moore, E., & Son.	West Liberty.	11	
Murphy, John E.	Lonerock.	50	
Myers, M. W.	Beaman.	11	2
Naab, Fred.	Elma.	40	
Nelson, G. J.	Kensett.	51	1
Neville, R. V.	Laurens.	21	3
Oloff, L. C.	Ireton.	28	9
Olson, A. R.	Thompson.		21
Olson, William H.	Forest City.	1	11
Ostrander, C. W.	Thompson.		16
Palmer, John L.	Kalona.		10
Pedley, James.	Britt.	6	1
Phillips, J. W., & Sons.	Havlock.	17	3
Phillips, Oscar.	Rolle.	14	11
Quillan, Phil J.	Waukon.		27
Reber, Joel D.	Wellman, R. 3.		13
Reese, H. C.	Prescott.	24	12
Rensberger, Roy.	Parnell.		11
Riebhoff, Frank.	Algona.	28	1
Ring Brothers.	Newton.	33	
Robinson, G. A.	Thompson.		12
Runchey, W. M.	West Bend.	16	8
Saunders, R. E.	Lonerock.	15	3
Schau, H. S.	Thompson.		25
Schmucker, Edward.	Kalona.		12
Schuerman, G. H.	Mt. Pleasant.	22	1
Schuerman, Leslie.	do.	7	1
Sheaffer, M., jr.	Adel.	6	2
Slaubaugh, Milton C.	Kalona.		10
Steffen, B. A.	Thompson.	4	18
Stenerson, John.	Woden.		36
Stofferson, C. N.	Harlan.	20	7
Swartzendruber, M. D.	Wellman.		20
Thorsen, Thom.	Leland.		16
Thorson, John.	do.		19
Troyer, A. F.	Kalona.	1	15
Turner, F. E.	Clemons.	30	
Weiland, H. J., & Son.	Britt.	8	6

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
IOWA—continued.			
Wertz, S. E.	Kalona		19
Wheeler, J. L.	Forest City	15	8
Winter, Sam.	Thompson		10
Woods, F. J.	Newton	17	12
Yoder, Eli S.	Kalona, R. 4	1	10
Yoder, Jason G.	Parnell		11
Yoder, John M.	do.		10
Yoder, Noah G.	Wellman		11
Young, M. J.	Sumner	1	16
Ziegler, Fred L.	Algona	1	20
KANSAS.			
Abrahams, E. H.	Emporia	27	
Ashcraft, J. W.	Atchison	49	
Anderson, H. S.	Holton	27	7
Anderson, H. C.	Americus	13	4
Appleton & Son, G. J.	Maple Hill	37	4
Bayer, Henry	Quincy	10	12
Breckbill, J. E.	Detroit	21	11
Baxter, Jas.	Clay Center	42	2
Brown, Loyd	Oswego	3	10
Bennett, S. W. & T. V.	Halls Summit	2	47
Coffman, Ross A., & Son	Overbrook	4	8
Cramer, G. W.	Lebo	4	15
Cunningham, R. H.	Harper	8	10
Cartmill, J. G.	Atchison	4	2
Coleman, W. R.	Lawrence	13	
Churchill, H. H.	Topeka	6	1
Dawdy, D. L.	Arrington	11	3
Dickson & Son, W. T.	Carbondale, R. 4	23	3
Daily, D.	Waverly	7	
Duston, M. Z.	Washington	26	6
Daily, R. B.	Waverly	14	7
Dews, J. W.	Osage City	12	
Firestone, W. M.	Maple Hill	5	8
Fuhrman, John	Lancaster	6	5
Haymaker, M. C., & Son	Scranton, R. 2	4	26
Hathan, Chas., & Son	Scranton	21	2
Heacock, E. E., & Son	Hartford	72	
Jasperson, V. A.	Scranton	20	25
Jewett, E. L., & Sons	Burlington	11	7
Lovett, Claud	Neal	36	6
Lyon, H. M.	Waverly	6	3
Lumley, J. G.	Emporia, R. 8	7	6
McLaughlin, F. C.	Waverly	4	6
McLenon Bros.	Everest	19	7
Malyneaux, W. H.	Palmer	35	
Malyneaux, J. A.	do.	7	
O'Dell, Stephen C.	Le Roy	11	12
Paton, J. E.	Winfield	7	3
Russell, Clayton	Emporia	5	7
Richardson, I. T.	do.	19	8
Shown, W. A.	Americus	5	7
Scholz, C. A.	Lancaster	23	
Smith, Chester & Son	Waverly	36	1
Stegelin, Ed.	Straight Creek	26	5
The Glanceys	Atchison, R. 2	86	
Waits, L. C.	Cassody	19	13
White, C. H.	Burlington	31	14
Yinzer, S. A.	Saffordville	29	
KENTUCKY.			
Belcher, G. B.	Glenwood	20	
Bowyer Bros.	Winchester	32	8
Butler, J. A.	Millersburg	15	5
Calloway, Joe	Smithfield	24	8
Clement, J. J.	Fulton	15	3
Cobb, Phelps	Danville	21	
Crawford Bros.	Lebanon	49	
Dorsey, L. L.	Anchorage	53	3
Fischer, Samuel, & Son	Elizabethtown	30	5
Gager, C. B.	Paris	37	3

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
KENTUCKY—continued.			
Gividen, N. S.	La Grange		16
Jones, R. H.	Uniontown	10	16
Lebus, Orie & Son	Cynthiana	18	7
Letton, Jesse	Paris	11	2
Letton, Reynolds	do.	15	4
McGahon & Jewell	Wilmore	11	6
Miller, L. W.	Elizabethtown	16	9
Peterson, H. D.	Millersburg	13	7
Reed & Snedegar	Minerva	30	4
Robertson, A. H.	Springfield	8	8
Switzer, R. W., & Son	Cynthiana	4	7
Wimsott, J. I.	Springfield	12	3
Woolery & Johnson	Crittenden	21	2
Young, R. C.	Bedford	21	5
Zehnder, D.	St. Matthews		29
LOUISIANA.			
Mayer, Mrs. M. R.	Shreveport	156	
Terry, C. P.	Greenlaw	5	
MAINE.			
Abbott, Sidney F.	Andover	10	
Allen, Charles W.	Auburn, R. 3.		13
Bates Brothers	Leeds Center		18
Davies, C. E.	Waterville	5	
Dunham, Harvey E.	Phillips	4	12
Ellis, A. H.	Fairfield	11	1
Dill, Mrs. C. O., & Son	Phillips	9	2
Fenderson, Garnett	Carmel	16	6
Frost, Rex	Waterville	1	12
Macomber, C. C.	North Jay	13	24
Osgood, Clarence H.	Fryeburg	4	10
Pierce, L. C.	Weeks Mills	1	20
Porter, C. E.	Houlton	5	18
Shirley, Oscar	West Houlton	10	4
Wood, Ross A.	Farmington		15
MARYLAND.			
Campbell, W. D.	Silver Spring	28	8
Hanft, Mrs. C. C.	Accident		10
Hanft, Wm. P.	do.		10
Loechel, W. C.	Grantsville		18
Stanton, J. U.	do.	2	11
Stanton, W. T.	do.	5	12
MASSACHUSETTS.			
Saltonstall, Robert	Readville	33	
MICHIGAN.			
Beland, Claire C.	Tecumseh	10	3
Davidson & Hall	do.	18	
Parmenter, Amos	Durand	11	20
MINNESOTA.			
Aal, Ingolf F.	Starbuck		39
Aarsvold, Benjamin	Peterson	6	21
Aarsvold, Joseph	Utica	1	35
Ackerman, George	Mapleton		10
Albers, Henry	Green Isle		19
Allan, Wm. D.	Lambert	3	13
Amundson, Arnold B.	Dawson	37	4
Anderson Mrs A. P.	St. Hilaire		20
Anderson, Elmer	Litchfield	5	28
Anderson, Iver	St. Hilaire		11
Anderson, Theo	do.		14
Andrews, C. C.	West Concord	19	27
Archer, A. H. & Son	Mora	12	2
Baarach & Zimmerman	Racine	1	13
Bain, R. J.	Fremont	5	7

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MINNESOTA—continued.			
Bandas, Frank.....	Biscay.....	38	.....
Banfield & Johnson.....	Austin.....	1	31
Barner & Johnson.....	Tenney.....	13	7
Barnett, J. C.....	Kilkenny.....	51	.....
Barzen, Matt.....	Thief River Falls.....	.....	25
Bennett, Geo. E.....	Mora.....	1	24
Bergsrud, A. H.....	Spring Grove.....	7	18
Bettinger, Elroy.....	Rock Creek.....	.....	10
Bigelow, Charles.....	St. Hilaire.....	.....	14
Bitner, Arthur.....	Winona.....	.....	18
Blair, L. J.....	Mora.....	6	6
Block, William.....	Hutchinson.....	.....	19
Blunt, D. A.....	Litchfield.....	.....	58
Borass Brothers.....	Hallock.....	6	25
Borden, H. G.....	Thief River Falls.....	.....	12
Bothman, C. J.....	St. Hilaire.....	.....	12
Bowen, S. S.....	Hancock.....	.....	12
Boyum, Clarence.....	Peterson, R. 2.....	8	29
Bratnober & Oakley.....	Anoka.....	26	.....
Brelje, Herman.....	Glencoe.....	.....	22
Broadwater, R. R.....	Preston.....	.....	16
Broadwater, Sam.....	.....do.....	8	9
Brown, E. L.....	Hancock.....	11	5
Budensick, A. W.....	Zumbrota.....	15	14
Bullard, August.....	Glencoe.....	.....	39
Bunkowski, Mrs. Ludwig.....	Kent.....	.....	14
Burckhardt, Henry.....	Russell.....	11	36
Burk, F. E.....	Mora.....	.....	10
Camery, H. W.....	Worthington.....	23	3
Camery, Ross W.....	.....do.....	3	5
Campbell, T. A.....	Forest City.....	16	38
Carlson Brothers.....	Hallock.....	2	6
Christensen C.....	Thief River Falls.....	.....	15
Cole, Benjamin.....	Canby.....	33	8
Cole, E. L.....	Spring Valley.....	.....	10
Cole, Guy.....	Mora.....	6	.....
Conzemius, J.....	Hastings.....	35	6
Conzemius, N.....	.....do.....	8	32
Cowan, Hector.....	Windom.....	57	9
Coyle & Dillman.....	Harmony.....	29	6
Coyle, J. H.....	Canton.....	27	2
Crandall, Ezra J.....	Morristown.....	.....	12
Crickmore, Wm.....	Owatonna.....	8	19
Cummings, Senator James.....	East Grand Forks.....	.....	29
Dahl, M. E.....	Twin Valley.....	61	9
Dammann, F. W.....	St. Hilaire.....	.....	10
Danek, J. D.....	Glencoe.....	.....	14
Danielson, H. H.....	Hendricks.....	14	.....
Davis, Thos.....	Lake Crystal.....	.....	12
Demmer, Peter.....	Caledonia.....	7	4
Denistoun, Thos. M.....	Brooks.....	3	20
Deopere, Rene.....	Cambria.....	1	15
Dickinson, W. F.....	Fairmont.....	9	6
Dobelstein, Clarence.....	Winona.....	.....	15
Doely, C. B.....	Spring Grove.....	22	.....
Doely, N. I.....	.....do.....	7	13
Domstrand, John.....	Wylie.....	.....	15
Donnay, Frank.....	Glencoe.....	8	20
Dovre, Olaf.....	Minneota.....	13	3
Doyle, Leo.....	Chatfield.....	18	4
Eastman, E. C., & Son.....	Litchfield.....	26	2
Eickhorst, Ben.....	Morristown.....	2	10
Eid, J. H.....	Montevideo.....	53	1
Eide, Gilbert.....	Utica.....	2	17
Ekberg, F. A.....	Herrnan.....	19	40
Erickson, Gust.....	St. Hilaire.....	.....	11
Erickson, Herman.....	Ogilvie.....	.....	11
Erickson, Martin.....	Wylie.....	.....	15
Estenson Bros.....	New Ulm, R. 5.....	1	15
Etter, Fred.....	Courtland.....	.....	14
Evans, Ed.....	Cambria.....	.....	10
Evans, Herbert.....	.....do.....	1	9
Fausch, C. D.....	Morristown.....	.....	16
Fausch, Christ.....	.....do.....	11	21

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MINNESOTA—continued.			
Ferrier, Chas. H.	Dover	72	
Foslien, Alfred K.	Garfield	34	
Freeman, Geo. W.	Zumbrota	18	
Freese, Arthur	Marshall	43	
Freese, Ed.	do.	15	
French & Smith.	Redwood Falls	23	
Furch, R.	Gaylord, R. 3	10	
Gerhart Bros. (NOTE.—Farm is in Minnesota.)	Staceyville, Iowa	3	
Gilbertson, G. G.	Utica, R. 1.	11	
Godfrey, O. I.	Beaver Creek	10	
Gorder, A. S.	Starbuck	2	
Gorder, C. J.	do.	5	
Gould, F. C.	Fairmont	2	
Gove, B. V.	Windom	1	
Griffiths, John W.	New Ulm		
Gruenhagen, Henry	Glencoe		
Gunn, Charles	Winona		
Gustafson, P. J.	St. Hilaire	1	
Hallstrom, P. A.	Wylie		
Hancock, C. E.	Chatfield	11	
Hanna, W. A., & Sons	Mapleton	40	
Hanson, H. J.	Dawson	7	
Harbo, Carl T.	Cambria	1	
Harm, F. H.	Norwood	4	
Harms, J. H.	do.		
Harrington, E. P.	Lamberton	5	
Hartman, Frank	Fairmont	4	
Hartman, Geo. M.	Rose Creek	17	
Hatz, Adam	Glencoe, R. 1	1	
Haune, F. G. & Son	Waseca	11	
Hawkes, A. S.	do.	21	
Hawley, Jas. W. H.	Albert Lea		
Heckle, John	Fairmont	17	
Hedlund, John	St. Hilaire		
Hedstrom, Ellis	Hoffman	3	
Heideman, J. C.	Montevideo	25	
Hewitt, George	New Ulm		
Hohner, Wm.	St. Hilaire		
Hope, I. Q.	Winnebago	6	
Hoyme, H. S.	Pipestone	36	
Hughes, B. D.	New Ulm		
Hughes, Robert	New Ulm, R. 5		
Hultquist, A. F.	Red Wing	20	
Hunt, S. E.	Thief River Falls		
Ingals, J. O.	Spring Valley	1	
Jecke, E. G.	Wykoff	1	
Jecke, Otto	do.	10	
Jensen, Hans	Hutchinson	31	
Johnsboy, H. M.	Starbuck	22	
Johnson Bros.	Atwater	37	
Johnson, E. G.	Litchfield	5	
Johnson, Ed. N.	Hallock		
Johnson, Frank	Sleepy Eye	9	
Johnson, Herman	Peterson, R. 2	7	
Johnson, Hjalmar	Wylie		
Johnson, John J.	Utica		
Johnson, John M.	Goodridge		
Johnson, M.	Winona		
Johnson, M. E.	Hayward	16	
Johnson, Oscar	Coon Creek	1	
Johnson, S. J.	St. Hilaire	3	
Jones Bros.	New Ulm, R. 5	1	
Jones, John F.	do.		
Jones, R. R.	Montevideo		
Jones, Thos. C.	Lake Crystal, R. 4		
Jordan & Hanson	Herman	51	
Kaniksan, John	St. Hilaire		
King, B. F.	Austin, Farm No. 2	11	
	Austin, Farm No. 3	11	
Kitterman, B. O.	Tracy	10	
Knoll, Henry	Winona		
Knutson Bros.	Lakeville	26	
Knutson, Elliel	do.	9	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MINNESOTA—continued.			
Koester, F. S.	Northfield.	26	14
Kramer, Diedrick	Young America	2	27
Kreber, John L.	St. Cloud	6	17
Kruse, Christian	Wylie.		34
Landman, Fred	Black River.		33
Lang, George, Meadowbrook Stock Farm	Mapleton	36	4
Larson, G. N.	Winnebago	17	1
Lassen, Hans.	Glencoe	17	2
Le Bessoniere, Jeff.	Red Lake Falls	19	17
Lee, J. B.	Waseca	8	26
Lee, Knute.	do.		28
Lefairre, Octave	Red Lake Falls		43
Lewis, Clyde	Mora.	14	7
Lewis, W. M.	Lake Crystal, R. 4.		12
Lindahl, P.	Hallock	5	14
Lindgren, Geo. A.	Hallock	2	8
Linguist, Chas. A.	St. Hilaire.	1	35
Lindquist, G. A.	do.		18
Lindquist, Gunnard.	do.		10
Lindquist, Raymond C.	Carver.		13
Lindstrom, Clarence.	Shafer.	4	17
Lloyd, John E.	New Ulm, R. 5.		15
Lofgren, Renuis.	Ceylon.		10
Logan, C. M.	Stewartville.	5	8
Lord, Clarence E.	Glencoe		10
Luehrs, Henry	do.		42
Lundberg, Peter	St. Hilaire.	1	10
McAndress, M. L.	do.	7	13
McDonald, J. H.	Fisher.	1	18
McIver Bros.	Farwell.	1	19
McMartin, Perry	Claremont.	17	11
McNellis, Ed.	Glencoe.	21	1
Maas, Adrian.	Faribault.		23
Maguire, James.	Dawson.	2	17
Marpe, C. P.	Twin Lakes.	2	9
Mathews, H. E.	New Ulm, R. 5.		12
Meinen, D. J.	Spring Valley		10
Meitrodt, Gust.	Caledonia	16	6
Melin, C. A.	Wylie.	2	24
Meyer, G. H.	Campbell.	1	10
Michael, Louis.	Minnesota City.		21
Miller, C. J.	Winona.		32
Moen, A. J.	Starbuck.	23	3
Molnes, E. J.	Russell.	14	4
Moore, Geo. M.	Jackson.	4	21
Moore, J. H.	St. Hilaire.		10
Moravec, Anton.	Glencoe.		10
Moren, Edward.	Wylie.		10
Morkassel, G. M.	Warren.	15	5
Mornel Stock Farm.	Albert Lea.	45	5
Morris, John T.	Mapleton.	15	12
Mortenson Bros.	St. Hilaire	1	23
Mueller, C. H.	Big Lake.	7	1
Murphy, F. W.	Wheaton.		28
Murphy, Wm.	Lakefield.	15	9
Musser, J. C.	Fairmont.	15	6
Muzzie, R. L.	Thief River Falls.		23
Myrah, E. G.	Spring Grove.	32	3
Naplin, John.	Wylie.		23
Nash, M. A.	Tracy.	74	
Neill, John.	Winona.		13
Nelson, Albert.	St. Hilaire.		12
Nelson, T. C.	Albert Lea.	10	16
Neuman, O. C., Shady Dell Farm.	Wheaton.	21	2
Nordlum & Morris.	Middle River.	48	4
Norwood, Chas. F.	Balaton.	15	7
Nouneman, Fred.	Fairmont.	5	10
O'Connell, P. J.	Glencoe.		19
O'Connor, Tim.	Preston.	11	12
Oen, Henry.	Thief River Falls.	5	14
O'Hara, James.	Lanesboro.	48	2
O'Neil, E. B.	Thief River Falls.		10
Oliva, John.	Hutchinson.	20	9
Ortloff, Chas.	Glencoe, R. 5.		23

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MINNESOTA—continued.			
Ortloff, Fred.	Glencoe		14
Otte, W. J.	Randolph.	19-	3
Owen, H.	Thief River Falls	6	28
Padelford, Cecil.	Austin	18	
Palmer, A. E.	Euclid	66	15
Patterson, Clarissa.	Minnesota Lake		14
Paulson, Chris.	Redwood Falls.	4	16
Person, Nels.	Wylie.		14
Peterson, Emil.	Isanti, R. 2	1	12
Pfiffner, J. R.	Stillwater	4	10
Pipestone County Poor Farm.	Pipestone	15	
Price, Enoch.	Cambria	1	
Price, Evan D.	do.		18
Provolt, Wm.	Glencoe		18
Raller, J. B.	Thief River Falls		13
Rannow, Henry O.	Biscay	12	22
Ranzau, George.	Glencoe		12
Rebuck, J. F.	St. Paul	22	14
Red Lake County Investment Co.	Red Lake Falls	21	48
Redmond, M. E.	Simpson	13	
Reese, B. T.	Marshall	44	6
Reid, A. E.	Lake Crystal.		20
Renstrom, J. A.	Mora.	5	4
Renum, Arthur.	Starbuck.	3	26
Rhen, Frederick.	Clearbrook.		11
Ries, Henry.	Wilson.	12	17
Ringey, Con.	Stewartville.	9	5
Ritter, J. D.	Winnebago.	13	9
Roark, P. W.	Thief River Falls.	12	23
Roberts, Enoch.	New Ulm		14
Roeufs, John.	Preston	1	10
Roose, W. E.	Plummer		21
Rosdahl, T. D.	Bricelyn.	7	14
Roster, Mike.	Freeburg.	19	9
Roverud, C. T.	Spring Grove	16	6
Roverud, H. S.	do.	14	3
Roy, James S.	St. Hilaire.	1	20
Ruddy, M. L.	Luverne.	64	
Ruud, Olaf.	do.	22	9
Ryan, A. C.	Red Wing.	19	1
Saueffer, Elmer.	Morristown	7	18
Sampson, W. C.	Litchfield.	3	25
Sandberg, Ed.	Wahkon.		10
Scherling, John S.	Motley.		18
Schlegel, A. A.	Le Sueur.		16
Schmidt, Wm.	Albert Lea.	1	10
Scholin, Swan.	Wylie.		15
Schroeder, W. A.	Lambert.	25	18
Selland, Gilbert.	Caledonia.	34	5
Shoopman, A. A.	St. Hilaire.		10
Simonson, Henry.	do.		11
Siverson Bros.	Thief River Falls.		10
Skjerping, Tobias.	do.	5	11
Sklyzacek, Frank A.	Wheatland.	10	15
Skogstad, Hans.	Thief River Falls.	3	8
Small, John.	St. Charles.	18	
Steele, Barney T.	Alden.	4	15
Stephens, E. H.	St. Hilaire.		11
Storrs, Chas. A.	Amboy.	11	11
Suprenant, Joe J.	Red Lake Falls.	1	25
Swanson, John N.	Goodridge.	1	22
Swanson, Alfred.	Ivanhoe.	7	13
Swanson, Arthur.	St. Hilaire.		13
Swanson Bros.	Wylie.		13
Taylor, T. B.	Mapleton.	16	1
Teare, W. L.	Hastings.		11
Tegelis, Antone.	Sedan.	5	16
Theiss, F.	Winona.		14
Thomas, D. E.	Lake Crystal		18
Throndrud & Sons, E. A.	Dawson.	43	9
Thrush, H. N.	Olivia.		10
Thyrene, E. J.	St. Hilaire.	1	22
Tiffney, D. M.	Redwood Falls.	12	24
Todd & Son, H. P.	Altura.	34	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MINNESOTA—continued.			
Todd, Thos. L.	Hendrum	26	3
Toothaker, H. G.	Fairmont	6	
Ufken, Anthony	Marshall	6	3
University Minnesota Farm	Waseca	7	31
Urdahl, Christ.	Goodridge		21
Vaaler, Walter	Spring Grove		12
Vaughen, Morgen	Goodridge		10
Wagner, J. H.	Red Lake Falls	2	17
Walstad, Andrew	Garfield		22
Ware, E. C.	Bingham Lake	14	2
Weber, Albert F.	Blue Earth	37	19
Weckwerth, O. C.	Thief River Falls	6	14
Weighill, W. A.	Pipestone	21	2
Welch, Robert	Winona		15
Wentzel, Louie A.	Crookston		24
Wick, J. Henry	Mapleton	1	19
Wigley, E. E.	Lake Crystal	5	22
William Bros.	Kimball	34	
Williams, Edwin	Lake Crystal, R. 4		20
Williams, R.	Cambria		14
Winter, J. A.	Eyota	3	16
Zehnder, John J.	Lake Crystal		13
Zelicky, Frank	Hutchinson	1	13
Zencius, W. M.	Glencoe		10
Zimmerman, A. P.	Spring Valley		21
Zinther, Paul	St. Hilaire		15
Zoppi, Nick	Champlin	20	9
MISSISSIPPI.			
Baker, W. R.	Grenada	12	5
Barkley, I. A.	Cotton Plant	1	5
Davis, Jno. W. & Sons	Natchez	22	12
Harmon, W. D.	Gatesville	5	99
Jones, R. W.	Grenada	61	
McCoy, E. E.	Flora	21	
Ormsby, W. T.	Natchez	9	
MISSOURI.			
Adair County Farm	Kirksville	7	8
Allder & Landers	Stockton	20	13
Arnold, R. Powell	Williamsburg	15	13
Austin, W. A.	Chillicothe	15	1
Bailey Bros.	Oregon	8	42
Baldwin, Frank	Plevna	27	
Barber & Williams	Skidmore	25	8
Barnes, R. L., & Sons	Clark	14	20
Bedsworth, Roy O.	Portland	14	1
Benz Bros.	Sedalia	7	7
Blakemore, A. C.	Walnut Grove	14	5
Burford, J. O.	Marshfield	12	4
Cies, A. W., & Son	Chillicothe	24	3
Coghill, E. A.	Kirksville	13	
Crank, J. W.	Springfield	12	41
Dale, I. F.	Sheldon	7	13
Donnell, P. E.	Waco	24	3
Edwards, J. C.	Morrisville	11	8
Elliott, J. D., & Son	Kirksville	25	1
Exler, George A.	Neeleys Landing		11
Finlay, W. H.	Sturgeon	9	
Fisher, F. C., & Son	Rea	21	4
Ford, J. N.	Sheldon	13	5
Garrett, W. P.	Portland	55	
Gehrke, E. W.	Kirksville	4	26
Glassey, A. A.	Cuba	13	41
Glenn, R. H.	Tarkio	12	3
Gray, L. W., & Son	do.	8	35
Green, George R.	Smithton		15
Halliburton, S. M.	Cairo	13	7
Hanebrink, J. H.	Cape Girardeau	1	13
Haman, Ed. A.	do.		13
Hartley, A. W.	Stockton	21	1
Henderson, R. J.	Purdy	5	5
Heuer, G. W.	Cape Girardeau	3	32

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MISSOURI—continued.			
Hobbs, Lee.....	Waynesville.....		12
Hoehns, H. E.....	Smithton.....		11
Homan, H. R.....	do.....		15
Hope, J. R.....	Pocahontas.....	12	16
Hudson, H. V.....	Novelty.....	12	2
Huff, C. D.....	Kirksville.....	7	10
Hunter, Frank L.....	Unionville.....	11	6
James, Harry.....	Kirksville.....	13	2
Job, J. B.....	Cape Girardeau.....	25	1
Kelley, A. H.....	Savannah.....	13	3
Kienninger, M. C.....	Pocahontas.....	10	8
Kies, L. E., & Sons.....	Jackson.....	14	15
Kinkead, E. E.....	Farmington.....	29	12
Kinkead, G. N.....	do.....	22	10
Lagle, George E.....	Millard.....	8	1
Laur, T. A.....	Westboro.....	34	24
Love, James L.....	Macon.....	33	
McCormick, E. C.....	Farmington.....	16	3
McElfresh & Huey.....	Clinton.....	30	
McIntyre, A. O.....	Oregon.....	24	5
Marbut, C.....	Verona.....	9	
Marbut, V. H.....	Monett.....	16	1
Masteron, J. A.....	Rogersville.....	1	31
Milliken, John A.....	Youngstown.....	13	
Montgomery, Joel & Son.....	Fairview.....	19	5
Morelock, J. E.....	Greencastle.....	16	3
Morelock, W. H. E.....	do.....	10	6
Nauman, Dr. O. W.....	Craig.....	29	16
Nelson, H. R.....	Walker.....	12	29
Overton, John V.....	Trenton.....	14	6
Parkin, Felix J.....	Fredericktown.....	9	
Patterson, J. M., jr.....	Liberty.....	14	12
Patterson, T. E.....	Walnut Grove.....		13
Randol, L. J.....	Jackson.....	12	10
Rankin, John A., jr.....	Tarkio.....	45	2
Rankin, Ed. F.....	do.....	86	7
Richards, J. F.....	Bevier.....	14	
Roberts, J. F.....	Rea.....	30	5
Robertson, Joe H.....	Armstrong.....	11	1
Rudy, George F.....	Smithton.....		11
Schluessing, J. A.....	do.....		30
Sherwood, I. V.....	Huntsville.....	16	29
Simmons, Lafe.....	Macon.....	28	
Smith, Bert.....	Clark.....	11	1
Smith, Mrs. P. F.....	Bunceton.....	15	
Smith & Jackson.....	Purdy.....	6	21
Steffey, C. R.....	Craig.....	10	2
Sunbarger, J.....	Tarkio.....	27	4
Thomas, E. H.....	Aurora.....	14	5
Triplett, D. F.....	Sibley.....	17	13
Tucker, Elliott.....	Perryville.....	11	8
Turner, W. R.....	Shelbyville.....	37	3
Turner, Cleve D.....	do.....	5	2
Volker, H. R.....	Tarkio.....	8	4
Watson, G. W.....	Kirksville.....	34	
Welch, E. O.....	Chillicothe.....	19	4
Welden, F. C.....	Portland.....	6	14
Whiteside, Ed., & Son.....	Chillicothe.....	26	3
Wilson Farm.....	Mansfield.....	86	4
Wilson, C. A.....	Tarkio.....	23	3
Wilson, C. T.....	Elmer.....	29	
Womack Bros.....	Fulton.....	59	
Wood, Denver.....	New London.....	18	5
Wood, E. R.....	Smithton.....		11
Wright, Ernest.....	Jacksonville.....	14	6
Wright, V. N.....	Walker.....	15	3
Wright, Charles J.....	Jacksonville.....	24	3
MONTANA.			
Allsop, Ezra.....	Bozeman.....		
Anderson Bros.....	Sioux Pass.....	11	17
Canapis, Nick.....	Butte.....		74
Clark, Guy G.....	Savage.....	25	32

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
MONTANA—continued.			
Dailey, W. E.	Power.	1	46
Deschamps, A. R.	Missoula.	12	.....
Downer, A. H.	Acton.	18	9
Eidum, Halvor.	Fairview.	4	5
Elliott, S. F., & Son.	Salesville.	13	41
Hagan, T. F.	Glendive.	42	12
Jenkins, T. F.	Twin Bridges.	50	13
Johnson, Hans.	Belt.	69	4
Kastien, A. W.	Beach, N. Dak. (ranch in Montana).	.....	30
Kellar, Sam.	Bozeman.	13	12
Larsen, A. Th.	Dagmar.	7	6
Lever, A. J.	Billings.	7	1
McCannon, J. L.	Huntley.	.....	11
Miller Development Co.	Wisdom.	13	17
O'Connell, C. L.	Kalispell.	11	19
Oftedahl, Sven.	Glendive.	.....	18
Price, J. C.	Conrad.	21	.....
Sales & Dickson.	Salesville.	44	91
Sexmith Ranch.	Hobson.	34	6
Sidebottom, E. E.	Acton.	5	13
Thompson, Knute.	Froid.	24	2
Ueland, R. R.	Antelope.	6	4
Vaux & Upton.	Sidney.	.....	58
Wolfskill & Mangier.	Molt.	20	17
NEBRASKA.			
Ahlschwede, Fred.	Milford.	8	5
Anderson, J. A.	Beaver Crossing.	26	2
Anderson, Walter.	do.	9	4
Andrews, Thos.	Cambridge.	36	7
Asmus, Emil.	Dorchester.	9	4
Axtell, J. A.	Fairbury.	62	4
Bailey, H. H.	Ord.	60	6
Barth, H. E.	York.	7	8
Bliss, L. E.	Alliance.	12	10
Boesiger, David.	Cortland.	42	11
Burbank, H. H.	Filley.	11	.....
Burklund, Fred.	Verona.	.....	20
Callaway, C. B.	Fairbury.	30	2
Carper, J. F.	Harvard.	38	.....
Chaffin, Edgar.	Kilgore.	30	30
Coatney, L. W.	Utica.	11	2
Croft, W. J., & Son.	Foster.	11	1
De Boer, J. W.	York.	22	4
Fetzner, C. D., & Son.	Falls City.	1	14
Ficke, C. D., & Son.	Pleasant Dale.	51	1
Fitch, W. C.	McCook.	.....	14
Fixemer, Adolph.	Geneva.	33	1
Foster, E. J.	York.	29	4
French, C. M.	Arlington.	9	.....
French, E. C.	Fremont.	10	3
Gelston Bros.	Elk City.	59	.....
Gross, Geo.	Sutton.	6	.....
Grosshaus, J. C.	do.	5	2
Harrell, W. C.	Hastings.	15	3
Hays, E. J.	York.	31	1
Humphries, T. F.	Culbertson.	17	7
Johnson, Godfrey.	Harvard.	1	11
Kelley, C. W.	McCook.	1	12
Koenig, A. L.	Spencer.	18	.....
McCarthy, C.	York.	27	.....
McCarthy, Jerry.	do.	13	3
McKelvie, C. H.	Lincoln.	6	2
McKinney, W. H.	McCook.	1	16
Miller, C. A.	Wymore.	15	5
Miller, Dan.	Milford.	8	4
Miller, M. M.	Wymore.	25	27
Mosely, P. F.	do.	18	3
Myers, W. A.	Seward.	20	.....
Nebraska School of Agriculture.	Curtis.	24	.....
Pierce Bros.	Atlanta.	52	.....
Plunket, Zeno.	Papillion.	.....	20
Pospisil, Wm.	Dorchester.	8	13

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NEBRASKA—continued.			
Rapp Bros.	St. Edward	73	20
Reid, W. H.	Edgar	6	6
Retzlaff, Albert	Walton		19
Ritchie, Geo. C.	Gresham	16	
Ritchie, Mrs. Ida	do	27	4
Roth, J. G.	Milford	22	
Rumsey, F. L.	Fullerton	16	3
Runty, Mrs. Chas.	De Witt	20	1
Saathoff, Karl	Wymore	3	17
Saathoff, Wilke	do	17	2
Sautter, H. E.	Scotia	46	
Sherwin, S. R.	Harvard	9	
Shoebottom, Ed	Fairbury		17
Stahley, Joel	Milford	19	12
Stahley, P. F.	do	14	
Stauffer, D. J.	do	17	7
Stunkard, D. B.	Red Cloud	4	5
Sylvester, W. B.	Burton	8	17
Tegler, T. J.	Meadow Grove	28	5
Thomas, Fred	York	32	8
Walker, H. E.	Lincoln	9	
Wasson, W. A. & F. H.	McCook		30
White, L. F.	York	26	1
Willey, C. R.	Liberty	19	3
Woods, M. H.	Fairfield	9	
NEVADA.			
Adams, W. R.	Genoa		32
Avilla, Frank	Reno		26
Allerman, F. A.	Gardnerville		40
Anderson, Jno. P.	Reno, Grand Central Hotel		11
Allum, C. M.	Yerington		22
Balsi, Angelo	Reno, R. 1, box 31		11
Banta, H. A.	Reno, box 318		19
Baker, H. B.	Reno, R. 2		54
Besso, Frank	Reno, 344 West Sixth		13
Bullentini, A.	Sparks, box 868		19
Bisagno, J. F.	Reno, R. 2, box 52		11
Block, N.	Sparks		21
Bull, Victor	Gardnerville		11
Cremetti, B. E.	Yerington		11
Cook, Fred	Genoa		69
Casazza, D.	Reno, R. 1, box 11		37
Capario, B. & John	Reno		11
Casco, Pio & Donati	Reno, R. 2, box 32		22
Casci, John	Reno, R. 2, box 29		15
Galligan & Lent	Sparks, box 162		13
Clark, W. M.	Reno, R. 2		49
Canepa, E.	Verdi, box 46		13
Casazza, Joe	Reno, R. 1, box 45		12
Callahan, James T.	Reno, R. 1, box 47		37
Christenson, J. H.	Reno		11
Durham, F. E.	Verdi		12
De Souza, N. J.	Reno, box 113		37
Depaoli, D.	Sparks, box 118		15
Dellamada'l'ena, Jno.	Fernley		18
Ferris, G. L.	Reno, R. 1, box 82		35
Figoni, A.	Sparks, box 446		12
Ferrith, Louis	Reno, box 382		22
Ferrari, D.	Reno, R. 2		10
Fulstone, Chas. L.	Carson City		28
Farretto, C.	Reno, R. 1, box 55-A		14
Ferretti, Joe	Reno, R. 1, box 36		20
Freitas Bros.	Yerington		39
Gerfoglio, Peter	Reno, R. 1, box 58		11
Gage, K. S.	Smith		40
Gardalla, Nick	Reno, box 125		11
Gardella, L. & Logamasina, G.	Verdi, box 2		18
Grose, Geo.	Reno, R. 2		26
Glock, Ben	Minden		19
Garrison, Paul	Verdi		38
Gariwocke, Gerafina.	Hufaker		38

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NEVADA—continued.			
Ginocchio, Nick.	Reno, R. 1, box 41		10
Holcomb Estate Co	Reno, R. 1, box 49		46
Heinsolh, Richard	Sheridan		15
Hellwinkel, John	Gardnerville		19
Hellwinkel, H. C	do.		22
Hansen, H.	Verdi		14
Hillbum, J. H.	Yerington		11
Hansen, Frank, jr	do.		17
Jacobsen, M.	Gardnerville		23
Johnson, H.	Minden		11
Jacobsen, C. W.	Gardnerville		11
Jones, H. I.	Sheridan		11
Jones, D. L., Co.	Gardnerville		11
Jacobi, B. A.	Reno, box 12		34
Kremmel, C. H.	Yerington		21
Knemeyer, Edward	do.		18
Kietzke, Albert	Reno, box 551		14
Kennedy, Wm. M.	Verdi, box 83		50
Lombardi, Giulio.	Reno, R. 1, box 52		10
Laughton, A. L.	Verdi, box 139		18
Lagaros, Mike.	Ruth		47
Lampe, H. C.	Gardnerville		11
Lucketti, G. B.	Reno, R. 2		11
Lemmers, Geo.	Sparks, box 167		14
McCloud, D. R.	Yerington		44
Mortenson Bros.	Verdi		30
Mattey, Jno.	Reno, R. 2		17
Mouro, M. P.	Reno, box 728		19
Molleys, Pete.	Sheridan		20
Marsh, H. E.	Reno, box 396		11
Madelini, J. D.	Reno, R. 1, box 51		12
Ormahea, Joe	Reno, box 42		48
Park, Joe	Sheridan		20
Park, Clarence	Gardnerville		24
Parosole, Lo.	Reno, R. 1		11
Parosole, J. H.	do.		10
Pezzi, D.	Reno, R. 1, box 54		25
Pechetti, Frank.	Reno, R. 1, box 46		26
Rosasco, C.	Reno, R. 2		18
Ruth Dairy Co.	Ruth, box 211		19
Riemann, John C.	Gardnerville		19
Rodgers Ranch.	Lovelock		10
Schaet, H. Wm.	Yerington		23
Sciaroni, A.	do.		14
Short, W. C.	Reno, 216 East Liberty Street	143	50
Scassa, Antone	Yerington		39
Schreck Bros.	Smith		31
Semenza, A.	Sparks, box 439		16
Stodieck, J. H.	Gardnerville		14
State Prison Farm.	Carson		55
Sundin, B. E.	Reno, box 439		19
Schneider, Joe	Carson City		20
Scassa, Mrs. Ernest	Sheridan		14
Settlemyer, H. W.	Gardnerville		24
Smith, Roy	Franktown		24
Thompson, P. T.	Reno, box 32		15
Tiedge, H.	Gardnerville		12
Tholke, J. D.	do.		10
Thulesen, C. T.	Verdi		243
Thran, D.	Gardnerville		40
Tran, Wm.	do.		10
University of Nevada Animal Husbandry Department.	Reno	14	5
Wehrman, H. W.	Gardnerville		13
White, C. C.	Sheridan		19
Yrilearren, Martin.	Reno, general delivery		36
Yori, Maria.	Reno, R. 2, box 16		11
Zolazzi, Jerry.	Huffaker.		11
NEW HAMPSHIRE.			
Barnes, Herbert M.	Lyme Center	11	12
Melanson, George W.	Intervale	11	

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NEW JERSEY.			
Tharp, Charles D.	Bloomsbury	7	
NEW YORK.			
Lafler, E. E.	Penn Yan	15	
NORTH CAROLINA.			
Banks, Charles	Asheville		15
Bernhardt, R. L.	Salisbury	16	1
Brown, Fred	Leicester		20
Brown, Roy T.	do.		15
Cansler, E. T.	Charlotte	11	
Cooper, G. T.	Whittier	6	5
Gwyn, T. L.	Springdale	19	2
Mann, J. B., jr.	Canton, R. 1		26
Mann, Jno. B.	Canton		12
Mann, J. F.	do.		26
Rice, J. Winston	Big Laurel	2	8
Wells, Otto	Leicester		14
NORTH DAKOTA.			
Adcock, Wm.	Valley City	1	15
Agnew, D. J.	Wildrose	8	8
Ahl, John	Denhoff	9	11
Amenia & Sharon Land Co.	Amenia	1	53
Anderson, A. M.	Mayville	5	
Anderson, Austin	St. John		16
Anderson, Chas.	Amenia		12
Anderson, Elmer P.	Maddock	1	11
Anderson, F. S.	Leal	1	18
Anderson, H. T.	Bisbee		15
Anderson, J. F.	Maddock		10
Anderson, Olaf	Grandin	1	21
Anderson, O. M.	Milton		16
Anderson, Theo. S.	Dazey	3	35
Andrews, Frank	Kenmare	5	5
Angevine, A.	Marion	5	13
Archer, Ralph P.	Finley	3	28
Arnold, Ray	Ambrose	18	
Asbjornson, Hans	Maddock		13
Ashwell Bros.	Williston	11	6
Atherton & Devore	Devils Lake	8	20
Auka, Martin	Bisbee		14
Aune, Jonn.	Milton		14
Axvig, Alfred O.	Edinburg		11
Axvig, John	do.		34
Axvig, Mrs. Knute	Milton		43
Axvig, Ole	do.		15
Baanna, Harold	Maddock		11
Back, Ole	Bisbee		10
Bader, William	Zeeland	2	13
Bailey, J. N.	Bartlett	8	18
Bairtsch, Chris	Marion	11	
Balder & Colony	New Rockford	1	25
Baron, E. J.	McClusky	3	14
Bartholmay, P. A.	Leonard		27
Bass, J. E.	Greene	15	3
Beasley, Frank	Fairdale	8	3
Beastrom, E. O.	Hazelton		15
Beck, Dan	Grandin	2	10
Beck, John A.	McClusky	2	22
Belcher, G. W.	Devils Lake	3	18
Bengtson, A.	Greene		11
Benson, Bernard	Maddock		11
Benson, W. N.	Sawyer	14	1
Berg, L. E.	Bisbee		11
Berge, E. B.	Cathay	3	11
Bergsnor, Olaf	Botineau	1	15
Bergson, O. E.	Esmond		15
Bergsrud, Andrew	do.	1	11
Berndt, Herman	Hankinson	9	8
Bernson, George R.	Edinburg		25

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Berthensen, H.	Merrifield	1	10
Blumer, Paul W.	Walcott		13
Blumer, Wm.	do.		20
Boeltcher, C. O.	New England		15
Borsinger, John	Bisbee		20
Braeside Hamilton Stock Co.	Rugby	19	
Braithwaite, Tom.	Esmond		14
Brakke, Albert	Wild Rice		13
Brakken, John	Horace		13
Brandt, Wm.	Sheyenne	9	14
Breileir, Fred	Verona		
Broe, H. G.	York		11
Brooks, C. E.	Temvik	2	23
Brown, M. J.	Milton	8	9
Brown, Mrs. R.	Devils Lake	1	27
Brunesdale, G. E.	Mayville	1	21
Bryant, W. L.	Greene	14	24
Budrow, Vere	Amenia		17
Bultema, Harry	Wimbledon		13
Burleson, A. W.	Kensal	4	18
Burgess, C. E.	Edmore	4	15
Burk, A. T.	Williston	10	
Burk, John	Juanita	25	2
Burkholder, J. P.	Clifford	9	
Burleson, E.	Kensal	1	10
Byram, W. C.	Wheatland		10
Calderwood, Geo.	Crary	9	
Calderwood, J. G.	do.	4	13
Carlson, A. J.	Wheatland	7	6
Carlson, Alfred	Lakota	1	10
Castlemo, Bert	Bantry	5	17
Christensen, Knut	Kensal		10
Christenson, A.	Oakes	10	10
Christianson, Ed.	Fargo	6	41
Clevan, Mrs. T.	Landa		16
Cockburn, W. C.	Webster	5	
Coffey, J. A.	Jamestown		22
Cole, H. F.	McHenry	11	8
Colebank Bros.	Brocket	43	1
Collins, I. N.	Amenia	3	12
Colwell, D. H.	Cardner		19
Colwell, S. P.	do.	1	48
Cooper, H. J.	Hillsboro		14
Cooper, Wm.	Lakota	10	
Cotner, J. W.	Flasher		10
Coughlin, Mrs. G. J.	Columbus		27
Councilman, John	Kensal	8	3
Crow, L. J.	Goodrich		17
Cummings, F. H.	Devils Lake		16
Curry, Sam.	Mercer		12
Cuypers, Leo	Dickey	9	
Daub, Wm.	Enderlin	15	23
Davidson, R. E.	Bartlett		19
Davis, S. S.	Starkweather	2	10
Dawson, C. B.	Guelph		12
DeHaven, J. J.	Garrison	8	9
DeHaven, W. D.	do.	5	12
DeMears, Frank	Carpenter		16
DeNault, C. E.	Jamestown	9	2
Dennis, A. T.	Flasher		19
Detwiler Bros.	Cooperstown		15
Didier, Joe	Sanborn	14	8
Dietlein, Peter	Braddock	7	
Discher, Fred	Leonard		14
Dittman, C. F.	McGregor	1	14
Doyle, E. J.	Penn.		34
Dryburg, George	Emerado	7	9
Duffey, Bernard	Esmond	5	10
Einerson, F. M.	Mountain	12	3
Eisenlohr, F. L.	Havana	4	11
Elton, Oscar	Carrington	7	
Enebo, J. H.	Pekin		18
Erickson, Andrew	Esmond	1	20
Erickson, E. A.	Portland		11
		3	14

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Erickson, Jonas.....	Kulm.....		16
Erickson, Knute.....	Petersburg.....		16
Erickson Bros.....	Bisbee.....		15
Eslinger, John.....	Fredonia.....		31
Evans, J. W.....	Michigan.....	2	22
Eveningson, E. M.....	Casselton.....	5	9
Farquhauser, R. M.....	Cando.....	17	
Ferguson, Kenneth.....	Carrington.....		15
Flom, Andrew.....	Milton.....		16
Flom, Herman.....	do.....		11
Flom, Mrs. Karen.....	do.....		20
Florence, Geo. E.....	do.....		13
Flugekoam, M. A.....	Edinburg.....		13
Flynn, Robt.....	Fairview.....	15	
Foster, R. C.....	Williston.....	23	2
Frandsen, John C.....	Verona.....	10	
Fransen, William.....	Braddock.....	5	11
Fredrickson, J. H.....	Horace.....		10
Freeman, O. J.....	Esmond.....	8	6
Gauski, Frank.....	Carrington.....	3	23
Gebhard, P. G.....	Amenia.....		10
Gedrose, T.....	Cathay.....	9	20
Gibson, Frank.....	Buchanan.....	17	
Gillespie, Thos.....	Milton.....		15
Gislason, Mrs. Gudrum.....	do.....	1	22
Glasscock, N. J.....	Watford City.....		13
Glenfield Hardware Co.....	Glenfield.....	10	5
Goldberg, J. H.....	Horace.....		17
Goodman, Jonas.....	Bantry.....	6	13
Goodrich, H. L.....	New Rockford.....	4	33
Graber, Jacob.....	Mylo.....		17
Graham, Ott.....	Crary.....	1	13
Graves & Co.....	Carrington.....	10	7
Gray, O. B.....	Page.....	11	
Gronset, John.....	Milton.....		20
Gurhus, Edroy.....	Edinburg.....	12	
Hagen, Iver.....	Rolla.....		16
Hannes, Christena.....	McClusky.....	1	18
Hall, H. B.....	Sheyenne.....	2	11
Hallquist, P. P.....	New Rockford.....		13
Halsten, Oscar.....	Fargo.....	5	8
Halvorsen, Theo.....	Horace.....		11
Halvorsen, H. L.....	Minot.....	69	
Halvorsen, H. S.....	McHenry.....	70	3
Hammer Bros.....	Cooperstown.....	59	4
Hanks, J. D.....	Werner.....	22	19
Hansen, A. H.....	Fillmore.....		12
Hanson, Marcus P.....	Towner.....		11
Harleman, T. E.....	Driscoll.....	15	6
Harrington, H. G.....	Page.....	6	
Haselkaas, Hans.....	Milton.....		28
Hector, M.....	Fargo.....		34
Hedberg, S. A.....	Donnybrook.....		13
Hedberg, Axel.....	Carpio.....		10
Hellar, Ole & Christ.....	Williston.....		21
Helgeson, Carl.....	Enderlin.....		15
Hellesvig, J. M.....	Maddock.....	4	19
Henderson, P. W.....	Enderlin.....	1	12
Herseth, H. O.....	Milton.....		15
Hertwig, Adolph.....	Amenia.....		11
Herzberg, Wm.....	Valley City.....		16
Hewson, A. M.....	Wimbledon.....	1	10
Hicks, L. O.....	Hickson.....		12
Higgins, Paul.....	Sarles.....	8	
Holstrand, C. H.....	Brinsmade.....	47	2
Hokanson, A. C.....	Kensal.....		14
Holden, Ole.....	Hampden.....	21	
Holle Bros.....	Devils Lake.....		19
Hollin, Andrew.....	Maddock.....	1	12
Holm, Nels.....	Kensal.....	6	
Holm, P. K.....	Pekin.....	5	30
Horne, John L.....	Penn.....	5	21
Hoopes, W. E.....	Carrington.....	17	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Hoopes & Sompson.....	Woodworth.....	46	10
Hoover, John.....	Petersburg.....	1	19
Horrock, Duncan.....	Milton.....		11
Hovde, Ludvig O.....	McGregor.....		13
Hunter, Dave.....	Esmond.....		17
Hunter, W. A.....	do.....		11
Huso, A. O.....	Crosby.....		23
Ingebo, A. O.....	Harvey.....		15
Ingles, John.....	Walhalla.....	3	14
Ingulrsrud, Ben.....	Milton.....		10
Jackson, H. C.....	Flasher.....		12
Jacobson, Hilmar.....	Maddock.....		13
Jeardon, P. H.....	McClusky.....	14	3
Johanson, Ole.....	Agate.....		21
Johnson, A. M.....	Esmond.....	1	13
Johnson, Arnold.....	Fullerton.....	1	30
Johnson, B. P.....	Northwood.....	18	7
Johnson, C. A.....	Williston.....	11	4
Johnson, C. O.....	McGregor.....	4	25
Johnson, Emil.....	Amenia.....		10
Johnson, Geo. P.....	Fullerton.....	1	27
Johnson, J. C.....	Mandan.....	15	
Johnson, Mrs. J. C.....	New Salem.....	12	
Johnson, J. W.....	Wild Rice.....	1	12
Johnson, Martin.....	Perth.....		22
Johnson, P. H.....	Jamestown.....		19
Johnson, Peter.....	McGregor.....		12
Jones, John.....	Garske.....		13
Jones, W. H.....	Hunter.....		17
Karkbraaten, Elling.....	Esmond.....		12
Ketwig, Mrs. C.....	Devils Lake.....		14
Kiblinger, J. A.....	Oberon.....	1	17
Kleppe, R. O.....	Kintyre.....		10
Klein, Roman.....	Merricourt.....	7	1
Klipstein, A. H.....	Menoken.....		10
Kluck, Charley.....	McClusky.....	1	10
Knappe, Edward.....	Oakes.....		17
Kolden, Peter J.....	Roseglen.....	10	2
Kovar, A.....	Flasher.....	1	14
Kops & Lehtinin.....	Lawton.....		14
Korn, Charles.....	Marion.....	3	46
Kornkven, Anton.....	Souris.....	5	9
Kristenson, N. B.....	Bisbee.....		10
Krokan, John.....	do.....		13
Krook, R.....	Fullerton.....	1	33
Kuch, John.....	Driscoll.....		26
Kurtz Bros.....	Hazelton.....	9	4
Kynoch & Young.....	Perth.....		13
Lake, Henry.....	Devils Lake.....		18
Laleum, A. P.....	Maddock.....		10
Laleum, P. O.....	do.....		13
Lamb, J. S.....	Michigan.....	8	4
Landsborough, H.....	Park River.....	10	
Larson, Carl.....	Greene.....		15
Larson, Mrs. Lavinia.....	Sheldon.....		18
Larson, L. J.....	Bisbee.....		14
Larson, Nels L.....	Zahl.....	7	10
Laske, Carl.....	Leonard.....		24
Lebeck Dairy & Stock Farm.....	Fairview.....	3	18
Ledene & Lundquist.....	Powers Lake.....	9	8
Lee, James A.....	Aneta.....	9	6
Lee, J. A.....	Crary.....		10
Lees, Norman.....	Buchanan.....	18	2
Lees, Norman & Will.....	do.....	8	16
Legge, Aaron.....	Forest River.....	18	8
Leonhardy Bros.....	Williston.....	20	1
Letson, M. E.....	Ellendale.....	3	20
Lichty, E. B.....	Cando.....	11	10
Liebig, August.....	Denhoff.....		26
Lien, O.....	Bisbee.....		13
Lindahl, Harry.....	Maddock.....	23	7
Lindstrom, John A.....	Denhoff.....	1	25
Lindtved, S. N.....	Milton.....		19
Lizotte, Stephen.....	Belcourt.....	6	

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List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Locken, Ingebrigt.....	Aneta.....	1	11
Lofland, M. L.....	Clifford.....	4	10
Long, John.....	Page.....	.....	24
Lorentzen, Gustave.....	Fillmore.....	.....	12
Lorenz, Jos.....	Nekoma.....	.....	11
Loudon, F. C.....	Devils Lake.....	1	23
Louski, J. D.....	Kensal.....	.....	16
Luddeke, H.....	Oriska.....	.....	17
Luhman, Geo.....	Dickinson.....	2	10
Luhman, John F.....	.....do.....	5	13
Lundeby, F. T.....	Tolna.....	11	15
Lunden, Hans J.....	Roseglen.....	3	17
Lunden, John J.....	.....do.....	1	12
Lykken, Hans O.....	Milton.....	.....	17
Lykken, Joe O.....	Edinburg.....	.....	11
Lykken, Teddy.....	.....do.....	.....	13
McCauley, James.....	Park River.....	4	16
McConnell, H.....	Bowesmont.....	.....	11
McKay, Mrs. Norman.....	Milton.....	.....	10
McKenzie, Frank.....	Wild Rice.....	.....	14
McKinny, L. C.....	Noonan.....	5	6
McLaurin, Herb.....	Milton.....	1	15
McLeod, D. M.....	.....do.....	.....	15
McLeod, D. S.....	Wheatland.....	.....	14
McMillan, A.....	McVile.....	.....	10
McMurray, H. G.....	Edmore.....	6	11
McRae, J. L.....	Watford City.....	15	.....
Major, Chas.....	Hillsboro.....	20	2
Mandigo, W. W.....	Braddock.....	1	20
Mandy, John G.....	Devils Lake.....	1	33
Marcelin, George.....	Olga.....	6	15
Martin, C. B.....	Lankin.....	7	.....
Martin, Helen.....	Halsted.....	1	11
Martin, L. H.....	Wheatland.....	.....	15
Martin, Moses.....	Sykeston.....	8	8
Matheson, Peter.....	Milton.....	.....	16
Matthey, Chas.....	Amenia.....	.....	12
Maulsby, Carl.....	Sykeston.....	10	8
Mayland, Edwin.....	Fargo.....	5	13
Mennie, Earl.....	Bottineau.....	.....	34
Meyer, Henry.....	Pingree.....	7	.....
Midbo, John.....	Edinburg.....	.....	12
Midbo, Oscar.....	.....do.....	.....	13
Middlebrook, A. W.....	Hanover.....	6	8
Miller, H. H.....	Fargo.....	.....	11
Mitchell, D. C.....	Courtenay.....	.....	13
Moeller, Geo. P. & E. A.....	Hettinger.....	9	3
Mollitor, John.....	Brinsmade.....	10	6
Montgomery, Robt. A.....	Harvey.....	.....	12
Montgomery, W. A.....	Fullerton.....	3	23
Moore, C. S.....	Hope.....	26	.....
Moore & Graves.....	Carrington.....	.....	10
Moris, George.....	Pembina.....	1	11
Morrill, A. D.....	Fairview.....	8	3
Morison, M. A.....	Milton.....	2	10
Morrison, C. R.....	Neche.....	1	10
Mosley, W. J.....	Dickinson.....	9	4
Moum, Philip.....	Buffalo.....	.....	23
Multz, Frank C.....	Bordulac.....	9	1
Munro, J. B.....	Crary.....	2	12
Musser, R. E.....	Burt.....	2	12
Myrvik, John.....	Milton.....	.....	11
Nagel, Peter.....	Lankin.....	8	1
Nassett, John.....	Esmond.....	1	13
Neibergall, John.....	Amenia.....	.....	10
Nelson, Abel.....	Agate.....	.....	15
Nelson, John K.....	Bisbee.....	.....	11
Nessett, J. O.....	Sheldon.....	3	15
Neurn, F. E.....	Dwight.....	16	.....
Newton, Geo. F.....	Sheldon.....	3	10
Newton, D. O.....	Grandin.....	11	.....
Newton Bros.....	Hunter.....	12	5
Nicolson, Neil.....	Calvin.....	2	11
Nienas, H.....	Thompson.....	2	13

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Nook, Jos. F.	Lankin	6	7
Nogosek, Frank	Kensal	5	15
Noon, Chas. W.	Wilton	5	16
Noon, John H.	do	17	28
Norheim, Rasmus	Esmond		10
Norris, C. E.	Sheldon	6	22
Agricultural College	Agricultural College	8	3
North Dakota Silver Black Fox and Investment Co.	St. John	18	4
Oakland, E. T.	Bisbee	6	11
Ocker, C. E.	Amenia		14
O'Connor, Pat.	New Rockford		11
Oglesby, Geo.	Wimbledon	5	6
Okon, Peter	Barton	10	1
Oliver, Herbert	McClusky	7	10
Oliver, R. E.	do	31	9
Olsen, W. T.	Devils Lake		11
Olson, A. S. & P. J.	Grafton	1	24
Olson, Nels P.	Braddock		21
Olson, O. J.	Esmond	5	14
Orn, Fred	Oakes		12
Orness, John L.	La Moure	15	2
Ostrom, Theo	Skogmo	11	14
Otto, Oscar	Amenia		12
Ott, E. J.	Donnybrook	1	10
Owen, Ole	Minot	6	
Parker, Geo.	Hillsboro	1	11
Parry, R. J.	Garske	2	16
Parsons, J. C.	Sheldon	1	11
Paulson, Carl	Sterling		11
Paulson, Richard	Bisbee		14
Pence, R. A.	Dogden	18	2
Pennington, H. K.	Milnor	9	
Peterson, Albert L.	Powers Lake		10
Peterson Bros	Braddock	4	22
Porter, Ira J.	Hoople	2	23
Pottinger, C. L.	Fillmore		15
Poulson, Chas	Bisbee		10
Prescott, Dave	Ross	16	2
Prieue, Theo.	Amenia		12
Prince, Edd	McClusky	1	17
Purfurst, H. F.	New Salem	12	8
Rambaugh, L. E.	Kintyre	3	30
Redhohn, Fred.	Wimbledon	1	10
Remington, George	Amenia	1	21
Renning, Hans	Maddock		13
Resser, W. C.	Fargo		16
Reudleman, W. H.	Beach		18
Richards, Grant	Jamestown	11	1
Richter, A. J.	New Rockford	6	16
Rivard, Olivia	Wild Rice		10
Rogaldson, Eric	Enderlin	4	26
Roll, Andrew	Hamlet		11
Rowland, R.	Esmond		12
Ruffcorn, W. E.	Arthur	6	2
Sakerton, John	Flasher		20
Sammelson, Edward	Horace		13
Sander, Mrs. Emma	Hatton	2	19
Sautebin, J. B.	Davenport	7	4
Schaffer, Phil.	Calvin	4	15
Schallern, A. V.	Fort Rice		14
Scheer, H. C.	Hamburg	17	
Schillinger, William	Russell	5	11
Schmidt, G.	La Moure	3	14
Schnetter, Wm.	Penn.	8	13
Schoeler, Herman, sr.	Courtenay		6
Schoening, Herman	Flasher		17
Schroeder, Nick	McClusky	7	3
Seaman, H. E.	Mandan		19
Sell, Will	Amenia		11
Seri, Andrew	Velva		10
Shaw, W. B.	Rhame	15	
Shawver, E. C.	La Moure	1	18

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
Sheldon, W. A.	Woburn		10
Shelver, Jacob.	Sheldon.		18
Shelver, L. K.	do.		12
Sherick, Thomas	Lankin.	5	
Sheridan, J. J.	Jamestown.		10
Sicard, Maxime.	Kramer.	21	1
Siebert, W. B.	Greene.		13
Simonson, A. S.	Fillmore.		12
Slater, W. H.	Esmond.		24
Smith, Andrew.	Maddock.	4	10
Smith, Chas.	Fargo.	18	1
Smith & Shay.	Roseglen.	14	
Smith, W. A. & Sons.	Grafton.	7	19
Somsen, Aaron.	Buchanan.	18	20
Sorlie, Peter.	Maddock.		16
Spingen, S.	Hankinson.	7	15
Stanley, M. A.	Kintyre.	3	11
Steer, W. J.	Mott.	8	
Steiberg, Jens.	Hamar.	1	20
Steinbach, Wm.	New Rockford.	2	24
Stenehjein, Martin.	Arnegard.	10	2
Steig, B. I.	Esmond.		17
Steneroddon, Oliver.	Hickson.		11
Stenslund, John L.	Edinburg.	1	26
Stensrud, J. J.	Maddock.		13
Stevens, Howard.	Esmond.		10
Stevens, Will.	do.		10
Steward, A. F.	Bottineau.	9	6
Stokes, Solomon.	Cathay.	2	15
Stonebeck, C. J.	McGregor.		17
Strumdaahl, John.	Lakota.		16
Sunby, Ed.	Williston.	5	12
Svee, Thor.	Perth.		15
Swanson, C. A.	Esmond.		11
Swenson, S. O.	Aneta.	5	
Tait, Robert.	Bottineau.	9	7
Taylor, A. D.	Flasher.		17
Telin, Peter.	McClusky.	1	15
Terwilliger, J. G.	Hankinson.		18
Tew, Olaf.	Wahpeton.	8	
Tewksbury, M. K.	Park River.	2	11
Thompson, Estel.	Rugby.		19
Thompson, T. A.	Milton.		13
Thompson, Wm. L.	Hatton.	4	10
Thorn, Robert.	Jessie.	12	3
Thorpe, S. H.	Enderlin.	1	13
Timmerman, Herman.	Amenia.		17
Toay, M.	Jamestown.	18	3
Tollofson, Arnt.	Esmond.		11
Toso, Conrad.	do.		11
Transgrud, B. A.	Milnor.	4	15
Trent, L. D.	Bottineau.	5	6
Trugstad, Ed.	Milton.		20
Turnbull, W. F.	Harwood.	17	
Twin Butte Stock Farm.	Bismarck.	22	
Umsted, John.	Esmond.	1	13
Unkenolz, W. R.	Mandan.	8	5
Uriell, Ed.	Lakota.	1	12
Vanerstrom, D. A.	Carpio.		19
Van Vleet, Will.	Esmond.	1	10
Veeder, Roy.	Mandan.	1	17
Vecum, Knute.	Esmond.		10
Vodden, John.	Argusville.	1	14
Volkmann, Rudolph.	Amenia.		10
Wallhood, George A.	Pekin.		16
Wallace & Baugh.	Carrington.	21	
Warddrip, Vernie.	Denhoff.	1	21
Warne, O. A.	Driscoll.		16
Watson, J. R.	Wheatland.		11
Watson, C.	Sydney.	7	17
Watson, W. W.	Milton.		10
Watt, Wm.	Leonard.	5	
Weik, Rasmus.	Oakes.		10
White, A. H.	Kramer.	13	

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
NORTH DAKOTA—continued.			
White, Fred S.	Amenia		16
White, G. A.	Portland	9	
White, W. J.	Casselton		12
Whiting, Robert	Carpio	14	3
Whitson, H. L.	Drayton	6	6
Wibe, Oscar	Bisbee		12
Wicka, Vince	Beach		10
Willy, Albert	Esmond		14
Wiper Bros.	do.	40	17
Woell, H. K.	Casselton		21
Wold, Peter	do.	4	16
Wolforth, Frank	Mount Carmel	16	5
Worley, G. P.	Pettibone	13	
Wright, Don, & Son	Walpeton	60	4
Young, W. M.	Driscoll		15
Zeigler, Frank	Amenia		10
OHIO.			
Adams, Frank	Akron	18	5
Ankney	Xenia	15	4
Bales, S. R.	Jamestown	14	1
Beatty, C. M.	Orient	3	2
Beecher, Daniel	Waterville		
Bixby, George W.	Norwalk	11	
Cahill, John	Tiro	3	5
Collins, J. E.	Peebles	4	6
Denzer Bros.	Waldo	20	1
Edwards, J. Wilson	Waynesville	3	4
Ellis, H. B., & Son	Wilmington	11	3
Folk, H. C.	Louisville	14	
Floyd Fought	Albany	25	
Galbraith Bros.	Tippecanoe		11
Graham, John F.	Lamira	18	2
Groves, D. F., & Son	Shelby	7	2
Heyman, Daniel	Monroeville	23	7
Hiney, C. M., & Ray	Wilmington		12
Hurst, Carl	Williamsport	5	8
Hyslop, Wm. W.	Springfield	11	4
Knutsen, Thos. C.	Blaine	14	7
Kuhn, W. N.	Shelby		18
Lance, Harry	Medina	3	12
Manchester, C. L.	Canfield	3	4
Miller, Lawrence	Marysville	14	
Musser, Ward	Marshallville	7	5
Mutchler, J. W.	Rutland		12
Oglesbee, C. A.	Spring Valley	2	9
Oglesbee, Wayne	Jamestown	17	1
Ream & Anson	Bowersville	45	2
Reed, Guy	Napoleon	7	5
Rexroth, J. N.	Marion	12	
Shanks, Branson	Jamestown	7	4
Simon, Chas. E.	Continental	11	1
Smith, Robert	Ashville	2	17
Tapp, Ernest	West Mansfield	27	2
Teegardin, C. B., & Sons	Duval	7	2
Trietch, Adam	Continental	19	3
Utendorff, J. H.	Ottawa	4	8
Verhoff, A. G.	do.	2	13
Verhoff, J. C.	do.	15	2
West, Roscoe L.	Hillsboro		11
		38	3
OKLAHOMA.			
A. & M. College	Stillwater	25	5
Allen, Lincoln B.	Guthrie	1	11
Arnold, V. J.	Calumet	1	21
Aud, J. A.	Waukomis		7
Austbo, D. O.	Nash	10	
Baugh & Peters	Douglas	20	3
Boles, W. S.	Enid	39	7
Bossart, T. C.	Kremlin	32	3
Boorsina, Everett	El Reno	17	
Bradley, W. L.	do.		22
Bright, Cecil	do.		21
			20

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
OKLAHOMA—continued.			
Bright, H. M.	El Reno.		19
Britton, R. N.	Waukomis.	27	3
Burkes, J. F.	Arcadia.	19	
Campbell, A. B.	Geary.	135	32
Campbell, J. W.	Enid.	12	5
Calif, J. W.	Kingfisher.	8	9
Cash, Alice.	El Reno.		32
Castle, A. L.	do.		18
Cecil, Robert.	Calumet.		16
Clement, C. C.	El Reno.		13
Christmas, Arthur.	Jefferson.	6	11
Corbin, O. H.	El Reno.		15
Copenbarger, H. C.	Geary.	8	3
Coulter, Tom.	Enid.	26	6
Cox, D. V.	Calumet.		18
Coward, J. H.	Lahoma.	17	
Darling, C. L.	Enid.	23	6
Davidson, Ray.	Pawnee.	34	1
Dickens, W. A.	Duncan.	21	1
Dickson, Otto E.	Lahoma.	7	9
Dowers, J. A.	Kremlin.	15	9
Dennison, J. C.	El Reno.		10
Earnhart, C. S.	Waukomis.	26	7
Essary, L.	El Reno.		14
Geary, W. C.	Geary.	5	9
Gibson, W. C.	Verden.	12	1
Gift & Gift.	Waukomis.	9	5
Hickman, J. T.	Temple.	25	3
Hayes, E. E.	El Reno.		36
Hilderbrand, H. C.	Bison.	2	15
Honegger, A.	Kingfisher.	6	14
Hopkins, C. M.	Calumet.		41
Huchtman, Barnard.	El Reno.		18
Humphrey, Neil.	Meridian.	13	2
Hutton, W. I.	Calumet.		20
Hyer, J. G.	El Reno.		15
Kellogg, W. M.	Guthrie.	1	46
Ketch, C. S.	Kingfisher.	10	7
Ketch, William.	do.	5	2
Koerner, E. H.	El Reno.		28
Lamumy, D. J.	Enid.	23	3
Lizor, W. R.	Douglas.	5	12
Lorenzer, W. L.	El Reno.		40
Martin, Otto.	Enid.	13	1
Mason, Earl.	El Reno.		19
Mathers, C. C.	do.		13
McBride, L. T.	Calumet.		27
McKinney, O. R.	Marlow.	40	
Meirer, Thomas.	El Reno.		49
Miller, Bros.	Bliss.	25	
Millick, Mrs. S. P.	Lahoma.	3	22
Mitchell, Morton.	El Reno.		22
Mohinks, R. C.	Waukomis.	6	5
Myer, H. D.	El Reno.		19
Newland, Jesse.	do.		34
Noel & Fraser.	Guthrie.	10	20
Pazwald, Otto O.	El Reno.		12
Peterson, Chas.	do.		35
Rice, George.	do.		47
Rice, Mrs. T. B.	do.		24
Riggs, Chester.	Enid.	7	3
Rinderhagen, J. D.	El Reno.	1	26
Rodes, A. U.	Geary.	13	10
Rusmisl, A. F.	Drummond.	15	20
Sutter, Frank J.	Enid.	20	
Swiggott, G. L.	Lahoma.	56	2
Taggart Bros.	Waukomis.	29	
Taylor, J. L.	Walters.	17	1
Thompson, Wilton E.	Watonga.	23	2
Verges, W. H.	El Reno.		27
Von Tringlem, Fred.	do.		37
Wade, A. I. & Son.	Douglas.	31	4
Wagoner, E. D.	El Reno.		29
Wagoner, J. B.	do.		49

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
OKLAHOMA—continued.			
Whistler Bros.	Watonga.	14	21
Wise, Steve.	El Reno.		14
Wire, Ira C.	Pond Creek.	5	2
Williamson, Melton J.	Jet.	6	5
Wright, W. C.	Calumet.		19
OREGON.			
Ballou, Homer B.	Boring.	9	
Beauchamp, N. O.	Free water.	5	69
Boyce, R. E.	Baker.	67	
Conley, Arch.	Cove.		11
Cook, Clinton.	Murphy.	16	
Cummings, Rodney B.	Mount Vernon.	6	
Cummings, W. O.	do.	177	106
Dorrance, W. C.	Enterprise.	15	
Hempe, S. A.	Union.	8	
Richey, O. M.	Boring.	18	
PENNSYLVANIA.			
Brown, Andrew.	Fayette City.	74	
Campbell, A. L.	Titusville, R. 1, Meadow Brook Farm.	4	22
Cheers, H. E.	Diamond, R. 1.	6	9
Clark, R. S.	Edinburg, R. 2.	5	9
Cochran, Hugh.	Centerville, R. 1.		11
Fox, J. Walker.	Enon Valley, R. 2.	10	5
Fox, William R.	Poland, R. 1, Ohio.	8	19
Harvey, B. O. & Son.	Tryonville.	2	20
Kling, E. W. & Sons.	Orangeville.	3	12
Lonclot, E. B.	Diamond, R. 1.		10
McKean, Harry P.	Penllyn, Pine Run Farm.	55	42
Miles, H. T.	Titusville, R. 3, Sideview Farm.	2	10
Moose, M. G.	Volant, R. 3.	11	
Montgomery, S. B.	Grove City, R. 16.	2	20
Shaffer, Charles.	Titusville, R. 3, Sugar Grove Farm.	3	19
Shaffer, D. M.	Apollo.		13
Thompson, Sara & Nan.	Pulaski, R. 62.		21
Wagner, C. G.	Westford, Homestead Farm.	20	
SOUTH CAROLINA.			
Henderson, W. N.	Ninety Six.	4	21
Lancaster Mercantile Co.	Lancaster.	2	30
SOUTH DAKOTA.			
Alberts, George.	Groton.		14
Altfillisch, Otto.	De Smet.	17	19
Barron Bros.	Elkton.	63	6
Brown, John.	Madison.	12	2
Brown, Wilson.	Rockham.	30	6
Buhr, H. C.	Andover.	1	14
Cleveland, H. A.	Hetland.	17	2
Clocksens, Fred.	Groton.		11
Conway, C. J.	Watertown.		26
Cook, Chas.	do.		19
Corbin, H. W.	Wentworth.	16	1
Dement, Edd.	Chester.	26	
Ehrenberg, F. J.	Groton.	1	10
Eisenlohr, F. S.	Havana, N. Dak.	25	
Emmen, George.	Andover.	1	16
Fette, Ernest.	do.	1	15
Gamber Bros.	Carpenter.	5	14
Grabinski, F. A.	Rockham.	3	14
Hanten, Harry B.	Watertown.	9	39
Hart, John.	Madison.		12
Heaviland, C. Earl.	Clark.		23
Johns, G. G.	De Smet.	6	2
Kroll, E. W.	Andover.	4	19
Lighthall, George.	do.	15	4
Little Eagle Sub-Agency.	Little Eagle.		32
Mallett, Harry W.	Andover.		15
Marston, I. E.	Pierpont.		13
May, Richard.	Andover.	1	11

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
SOUTH DAKOTA—continued.			
McCaskell, Fred.....	De Smet.....		17
Mills, C. E.....	Andover.....	4	18
Moir, A. C.....	do.....		25
Mortensen, Nels P.....	do.....		15
Mueller, P. C.....	Groton.....	1	9
Norris, Henry.....	Andover.....		14
Osness & Stollsmark.....	Pierpont.....		18
Overskei, Olaf.....	Nunda.....	6	3
Oxton, A. P.....	Andover.....	5	10
Parrott, Jesse H.....	Pierpont.....	1	12
Peterson, Axel W.....	Rosholt.....	10	8
Priebe, A. A.....	Bijou Hill.....	33	4
Prunty, Francis P.....	Andover.....		13
Schuring, Henry F.....	do.....	2	19
Schuring, Herman A.....	do.....		21
Seeley & Smith.....	Dell Rapids.....	35	4
Snowden, J. E.....	Buffalo Gap.....		10
Sperry, C. J.....	Groton.....		13
Swisher, Geo. P.....	Henry.....	1	11
Tobin, Frank.....	Nunda.....	17	11
Tribley, S.....	do.....	17	
Volkman, J. C.....	Rockham.....	2	4
Voss, Harry.....	Andover.....	1	15
Wenck, Wm.....	do.....		14
TENNESSEE.			
Adams & Galbraith.....	Harriman.....	9	3
Bright, D. A.....	Chucky.....	15	5
Bright, R. W.....	Telford.....	35	7
Brinkley, S. R.....	Ashland City.....	3	9
Caldwell, D. M. & C. F.....	New Market.....	20	2
Carson, C. B.....	Limestone.....	14	4
Childers, J. R.....	Fayetteville.....	25	5
Conger, D. L.....	do.....	49	9
Cunningham, E. C.....	Clarksville.....	14	7
Denny, W. H.....	Gallatin.....	7	4
Devault, H. M.....	Greenville.....	7	2
Mitchell, S. F.....	Limestone.....	13	
Motlow, F. W.....	Lynchburg.....	26	6
Orr, Miss Etta.....	Roan Mountain.....	14	18
Peck, Joe H.....	Jefferson City.....	11	
Squibb, H. P.....	Limestone.....	9	2
Smith, S. S.....	Whitesburg.....	11	
Smith, C. D.....	Memphis.....	19	
Stone, E. H.....	Cumberland Furnace.....	12	2
Thompson, J. J., jr.....	Paris.....	7	5
Weeks, J. W.....	Jonesboro.....	23	2
Williams Bros.....	Ashland City.....	12	2
UTAH.			
Adamson, Peter.....	Alpine.....		11
Bennion Minor Co.....	Salt Lake City.....		40
Bodily, Fred.....	Layton.....	6	28
Clark, Jos. S.....	Farmington.....		10
Crus, Joe.....	Helper.....		15
Cullimore, W. J.....	Linden.....		11
Featherstone, Thos.....	American Fork.....		12
Fowles, Jos. H.....	Hooper.....		13
Godfrey, Sid.....	Murray.....		17
Gillis, Herman.....	Provo.....		10
Harris, Ed.....	Pleasant Grove.....		23
Harris, Albert.....	do.....		10
Hill, A. J.....	Salt Lake City.....		17
Howard Bros.....	Woods Cross.....		23
Jarman, Tom.....	Pleasant Grove.....		14
Johnson, A. W.....	do.....		10
Johnson, J. S.....	Provo.....		23
Joseph, Harry.....	Salt Lake City.....		25
Larsen, Lewis.....	Manti.....		30
Loosel, I. E.....	Provo.....		10
Marcroft, J. A.....	Salt Lake City.....		29
Mozzell, J. H.....	Provo.....		11
Nalder, S. H.....	Layton.....		46

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
UTAH—continued.			
Nelson, A. C., jr.	Ephraim	9	
Oberts, Joe	Helper		14
Utah Agricultural College	Logan	13	2
VIRGINIA.			
Allen, L. M.	Gaylord	24	4
Baird, A. V.	Delaplane		19
Bromley, W. S.	Berryville	17	4
Brown, John T.	Rural Retreat	7	9
Board, G. W.	Christiansburg	4	13
Bryant, C. E.	Bridlecreek	31	14
Buchanan, J. A.	Saltville	11	3
Burwell, Geo. H.	Millwood	5	19
Cather, Jno. C.	Winchester	41	6
Cloyd, D. M.	Blacksburg		12
Coimer, H. E.	Swoope	41	
Cox Bros.	Independence	22	
Crabtree, Frank	Dryden	5	4
Craig, C. G.	Craigsville	5	6
Crowgly, H. B.	Wytheville	21	2
Crummett, R. H.	Monterey	8	14
Flickwir, D. W.	Roanoke	18	1
Garber, G. E.	Bridgewater	6	6
George, John R.	Broadford	18	6
Harrison, Fairfax	Belvoir	2	24
Hicks, T. J.	Winchester		14
Higginson, J. M.	Red Hill	23	1
Huddle, J. H.	Ivanhoe	7	10
Koontz, Rae T.	Luray	51	1
Logan, C. R.	Catlett		18
Long, A. W.	Luray	11	
McNeil & Quillen	Jonesville	9	6
Martin, D. R.	Waynesboro	2	33
Michie, A. R.	Charlottesville		17
Minton, W. D.	Jonesville	13	19
Moffett, R. W.	Mint Spring	16	15
Mooman, O. N.	Elliston		18
Moore, S. H.	Stuarts Draft	10	1
Moore, S. L.	Lodi	6	20
Nestor, J. A. & Co.	Wyndale	18	3
Payne, C. M.	Calverton		25
Sanders, Marvin	Chilhowie	19	
Showalter, Amos	Riner	13	27
Thompson, T. J.	Swoope	21	8
Trumbo, Jacob	Calverton		20
Umberger, C. B.	Wytheville	2	9
White, C. H.	Linden	12	7
Wood, John W.	do.		30
WASHINGTON.			
Conley, E. H.	Cheney		13
Coyle Brothers	Walla Walla		70
Delaney, Henry	Starbuck	8	
Greif, Carl A.	Uniontown	17	
Griffith, S. R.	Cheney		18
Harbert, J. W.	Walla Walla	11	
Hubbell, W. F.	Cheney		23
McKay, James W.	Govan		10
Miller, J. G.	Cheney		19
Reeves, Frank & P. H. Miller	Wenatchee	6	
Smith, E. C.	Cheney		24
Taylor, B. P.	Colville		10
WEST VIRGINIA.			
Beiry, John	Wheeling, R. I.		20
Billick, Geo. G.	West Alexander, Pa.	4	13
Eis, C. A.	Wheeling, R. R.		13
Fisher, Aug. H.	Elm Grove	4	22
Fisher, John	Wheeling, R. R.		21
Frazier, M. H.	West Alexander, Pa., R. R.	2	14
Grimes, W. H.	Elm Grove		15
Johnson, M. A.	Sinks Grove	4	6
Johnson, W. B.	Fort Springs		26

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
WEST VIRGINIA—continued.			
McColloch, John.....	Wheeling, R. 1.....	.....	11
McLaughlin, H. W.....	Maxwelton.....	35	5
Price, E. G.....	Triadelphia, R. 1.....	.....	11
Skaggs, Handley.....	Lewisburg.....	2	12
Steele, W. E.....	Wheeling-Glenwood.....	.....	11
Stillwagner, A. J.....	West Alexander, Pa.....	.....	13
Van Meter, J. F.....	Shepherdstown.....	11	11
Wallis & Son, G. W.....	Hogsett.....	.....	38
Williams, John T.....	Triadelphia.....	.....	19
Woodruff, I. C.....	Dallas, R. 1.....	1	16
WISCONSIN.			
Ashton Bros.....	Arcadia.....	35	6
Clark, Geo. F.....	Avalon.....	7	3
Collins, P. N.....	River Falls.....	25	2
Collins, Thos. C.....	Kendall.....	.....	16
Collomore, W. A.....	Ellsworth.....	7	7
Cross, J. S.....	Winniconne.....	24	2
Dwyer, Jas.....	Kendall.....	1	19
Fitzpatrick, Chas.....	Neenah.....	13	8
Gorham, Leonard.....	Viroqua.....	.....	19
Green, Paul C.....	Baraboo.....	4	13
Hadden, James, & Sons.....	Janesville.....	10	22
Hooper, W. A.....	Palmyra.....	14	13
Jenkins, W. C.....	Bangor.....	7	18
Johnson, Gilbert.....	Larsen.....	.....	17
Kinney Bros.....	Hudson.....	.....	33
Kinney, Mrs. H.....	do.....	.....	31
Klein, E. R.....	Fountain City.....	50	3
Lamb, R. W., & Son.....	Janesville.....	39	.....
Langbein, M., & Son.....	Ellsworth.....	13	5
Lathers, John W.....	Beloit.....	8	9
Marco, G., & Son.....	La Crosse.....	40	3
Mattison, Thos.....	Blair.....	16	12
Niland, Dominic.....	Cylon.....	.....	10
Padden, A. J.....	do.....	.....	15
Sayre, D. F., jr.....	Edgerton.....	20	3
Skutley Bros.....	Secherville.....	16	7
Smith, Eli.....	Eau Claire.....	8	15
Southworth, B. P.....	La Farge.....	28	9
Southworth, G. E.....	do.....	15	4
Taylor, John R.....	River Falls.....	13	29
Wentworth, Archie I., farm No. 1.....	Edgerton.....	22	6
Wentworth, Archie I., farm No. 2.....	do.....	8	33
Whelan & Everson.....	Mondovi.....	13	5
Williams Bros.....	Bangor.....	37	.....
Wood, John.....	Viroqua.....	.....	27
Total(Shorthorn, United States).....	.....	19,722	25,208

MILKING SHORTHORN.

ILLINOIS.			
Brington Bros.....	Cameron.....	41	2
Cole, A. T.....	Wheaton.....	36	.....
OKLAHOMA.			
Collett, George W.....	Edmond.....	20	5
VERMONT.			
Booth, Arthur E.....	Vergennes.....	.....	28
Burt, Craig O., Smith farm.....	Stowe.....	.....	25
Burt, Craig O., home farm.....	do.....	12	47
Cary, George C., Pine Lodge farm.....	St. Johnsbury.....	30	.....
Clement, William.....	do.....	.....	56
Folsom, D.....	Waitsfield.....	.....	35
Holmes, Gerald.....	Barre.....	.....	15
Simpson, Arthur W.....	Lyndonville.....	23	.....
Smith, George, Est.....	Vergennes.....	.....	12

List of once-tested herds of not less than 5 purebred or 10 grade cattle, showing owners, breeds, and States in which located—Continued.

MILKING SHORTHORN—Continued.

Name.	Address.	Cattle once tested without reactors.	
		Pure-bred.	Grade.
VERMONT—continued.			
Ward, F. C., & Son.....	Vergennes.....		25
Whitney, Frank W.....	Salisbury.....		15
Whitney, Fred C.....	do.....		22
Total (Milking Shorthorn, United States).		162	287

POLLED SHORTHORN.

ILLINOIS.			
Boock, W. C., & Son.....	Little York.....	38	..
Davis, M. F.....	Polo.....	5	15
Gingrich, J. C.....	Pontiac.....	10	4
Pinkstaff, C. H.....	Pinkstaff.....	16	..
INDIANA.			
Ginn, William H.....	Delphi.....	13	1
Kaiser, W. H., & Son.....	Lawrenceburg.....	1	22
IOWA.			
Benell, J. A.....	Kalona.....		19
Boise, Dr. C. L.....	Dunlap.....	5	4
Shetler, John J.....	Kalona, R. 1.....	6	11
KENTUCKY.			
Coke, C. Guthrie.....	Auburn.....	13	8
O'Donoghue, Tom.....	Hardinsburg.....	5	12
McGaughey, R. H.....	Herndon.....	19	8
MINNESOTA.			
Guillaume, Anthony.....	Caledonia.....	16	..
Nelsen, Harry.....	Glencoe.....		37
MISSOURI.			
Huggins, W. T.....	Utica.....	17	..
Wenger, Ed.....	Versailles.....	11	2
Wenger Bros.....	do.....	22	3
NEBRASKA.			
Cadwalder Bros.....	Oxford.....	2	28
Ketterer, John.....	Bethany.....	24	1
NORTH DAKOTA.			
Rohn, A. C.....	Herwood.....	1	12
SOUTH DAKOTA.			
Belau, Fred V.....	Rockham.....	41	16
Haven, F. G.....	Mellette.....	32	..
McLaughlin, J. F.....	Mitchell.....	37	3
Wertz, Arthur.....	Bancroft.....	18	5
TENNESSEE.			
Gwaltney, L. H., & Son.....	Hickman.....	13	3
Total (Polled Shorthorn, United States).....		365	214
Total (all breeds, United States).....		95,097	137,807

AUSTRALIA AND NEW ZEALAND AS MARKETS FOR AMERICAN FRUIT

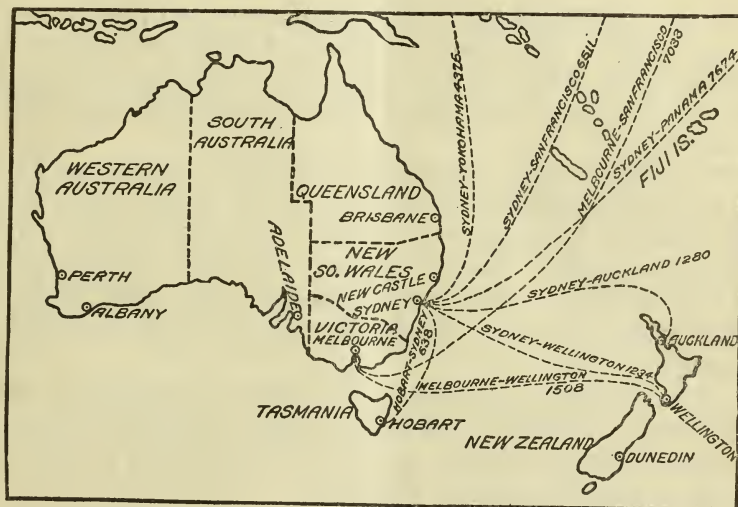
SAMUEL B. MOOMAW

Special Investigator

and

CAROLINE B. SHERMAN

Scientific Assistant



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DEPARTMENT CIRCULAR 145

Contribution from the Bureau of Markets
GEORGE LIVINGSTON, Chief

Washington, D. C.

February, 1921

AUSTRALIA AND NEW ZEALAND AS MARKETS FOR AMERICAN FRUIT.

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DESCRIPTION.

Australia.—Australia is divided into three belts or zones, marked by broad climatic differences, the effects of which are perhaps more noticeable in the output of the orchards than in any other products of the soil. In these broad climatic zones there are, of course, numerous variations.

In the southern belt, comprising Tasmania, the greater part of Victoria, and considerable parts of New South Wales, South Australia and Western Australia, the climate is similar in many respects to that of southern France or northern Italy. There are the farms and the wheat fields and there the apple, pear, plum, and cherry flourish. Apples form the chief fruit crop and their production is increasing each year.

The middle belt, comprising parts of all the continental States, was, with the exception of the coastal districts, devoted in the early days almost entirely to sheep stations or ranches, but is the natural home of the peach, grape, fig, and olive.

In the northern belt, comprising the Northern Territory and the northern parts of Queensland and Western Australia, the inland districts are mainly occupied by cattle runs, while in other parts the mango, pineapple, coconut, and banana thrive. A great increase in its production of tropical and semi-tropical fruit during the next few years has been predicted.

New Zealand.—Fruit growing in New Zealand is still a young industry. With the general development and progress of the country, however, the production of fruit has begun to increase in importance. Especially has this been true during the last few years. New Zealand has a great variety of temperate climate and a fairly well and evenly distributed rainfall, making it possible to raise almost any kind of fruit that can be grown in the temperate zone. The mountain valleys have a hot summer heat that will ripen fruit to perfection. Much

of the poor clay land in the Auckland district, hitherto considered almost useless, has been found to be well adapted to fruit growing.

Value of fruit crops.—The World War and the consequent lack of ships for transportation have had a retarding influence on the development of the fruit industry in both Australia and New Zealand, although for many years the tendency has been toward a general increase in the production of fruits. This increase was most marked in Victoria, where 27,864 additional acres were laid out in fruit cultivation during the last 10 years. In Tasmania and Western Australia also, the acreage in fruit was greatly enlarged owing principally to extensive plantings of apple trees with a view to the possibilities of selling the fresh fruit in English markets. The value of the fruit crops of all kinds in the whole of Australia in 1917 was \$16,921,808.

METHODS OF MARKETING DOMESTIC FRUIT.

Most of the domestic fruit is sold through the city markets by wholesale, consignment, or auction, but some is retailed through market stalls. Many of the large markets are municipally owned or controlled. In Queensland and in New Zealand some fruit is sold to canneries and preserve factories, a part of the output of which is sometimes exported. Some sales of fruit are made direct from producer to consumer, especially in New Zealand, where the Government has facilitated such sales by the "fruit by post" system. Cooperative marketing societies are found in parts of Victoria, in Tasmania, South Australia, and Queensland. In New Zealand the Government has assisted cooperation among fruit growers in the form of its New Zealand Fruit Growers' Federation (Ltd.) by issuing an orchard tax act of 1916, which provides for the levying of a minimum tax of \$0.24 and a maximum tax of \$0.61 per acre on commercial orchards, the proceeds to be paid over to the Fruit Growers' Federation and to be expended in any of the fruit-growing industries. The act is to remain in force until 1921. The earlier practice of grading apples in Australia and New Zealand related particularly to size, but in recent years the influence of methods in use in the boxed apple districts in the western United States has been felt. In Australia the various States make their own fruit-grading laws. The Victoria fruit act of 1917 authorizes the Governor in Council to make regulations fixing standards for fruits and vegetables based on size, quality and color. The Tasmanian authorities have also issued regulations regarding the export of fruit in which are incorporated grades very similar to those in effect in New Zealand, described below. In New South Wales the grades Extra Fancy, Fancy, and C are also in use, at least to some extent. The New Zealand Department of Agriculture in its regulations issued new provisions of the orchard and garden disease act which provided for three grades of apples—Extra Fancy, Fancy,

and C. These grades are based on size, quality, and color, the specifications following closely those in use in the northwestern section of the United States.

The disposal of a part of the crop through dried, canned, and preserved fruits, including jams, has increased in recent years in both Australia and New Zealand, as a result of the extension of fruit growing and the demand for jams for military use.

THE EXPORT TRADE.

Australia.—In the years preceding the European war Australia was developing an increasing export trade in fresh fruits of all varieties, especially with its neighbor colony of New Zealand and the ports of the mother country. Naturally the decreased shipping incident to the war makes a comparison, such as statistical tables might ordinarily furnish, untrustworthy. Nevertheless the American shipper may be interested to have the figures furnished by the official Australian returns at hand, and for this purpose Table II is given in the appendix. This table shows the average of exports of fruits for the years 1912 and 1913.

Prior to the war, New South Wales, Victoria, South Australia, and Tasmania had limited export industries but these suffered considerably during the war period. In some cases the increased foreign demand for preserved fruits and jams seemed to counteract to a certain extent the effect of the decreased export trade for fresh fruits.

The principal ports of Australia are Sydney, Melbourne, Adelaide, Brisbane, Fremantle, Newcastle, Hobart, and Port Darwin. All of the principal harbors of Australia are under the control of harbor boards that decide upon the improvements and the development of facilities.

Sydney, the capital of New South Wales, situated on Port Jackson, is the largest city and is the receiving port for all the inland towns of New South Wales. All the main railways of the State converge there because of the depth of the harbor and its excellent dock facilities and capacity for shipping. The tonnage cleared from Sydney each year far exceeds that of any other city in Australia. The produce of inland districts is sent by rail to Sydney for marketing or export.

The network of railways in Victoria connect at Melbourne and make it a considerable distributing center. Much has been done for the improvement of its docks and wharves. Hobart has an excellent harbor, the best in Australia for deep-draft ships, with good dock facilities and carries on a noteworthy trade in fruit exporting. In prewar days Hobart was in direct steamship communication with London, Liverpool, Glasgow, Hull, Hamburg and other European ports, and with South Africa during the fruit export season. Fruit for South American ports was sent to New Zealand for transshipment.

New Zealand.—The export trade of New Zealand is in its infancy, but fruit has been sold either direct to buyers overseas or on consignment through the New Zealand Government with a guaranty of a minimum price by the Government. During recent seasons the New Zealand market has been greatly assisted and regulated by a limited export trade with South America. Apples are packed and graded under Government supervision, with very satisfactory results, so that the prospects for an expansion of this trade are good.

It is thought, however, that in view of the greatly increased number of orchards neither the local market nor the South American market will absorb the amount of fruit available for the next few years. Hence, orchard instructors have recommended the planting of apples and pears suitable for export to the markets of the Northern Hemisphere and have issued lists of varieties favored.

The difficulty of obtaining freight space under war conditions checked the growth of exports, but with a return to normal freight condition and sailings the effect of the Government recommendations undoubtedly will be apparent, and the export trade in fruit may be expected to receive a noteworthy impetus.

Official figures, showing the quantity of fresh apples and pears exported from New Zealand in the years 1912 and 1913, have been averaged in Table III.

The extensive coast line and the numerous harbors of New Zealand facilitate traveling and distribution of goods by sea, and coastal steamers are much used in connection with both exports and imports. The principal ports are Auckland, Wellington, Christchurch, Dunedin, and Invercargill. Auckland has probably the best dock facilities in New Zealand, while those of Wellington are very good.

THE IMPORT TRADE.

Australia.—Notwithstanding the extent of fruit raising within her boundaries, Australia imports no inconsiderable quantities of both fresh fruits and dried, canned, and preserved fruits. Fresh fruits are imported especially in off seasons, and the preserved fruits are brought in to supplement the shortage of such supplies.

Victoria imports chiefly bananas from the Fiji Islands, oranges and lemons from the United States and Italy, and apples from the United States and Canada. Queensland receives prunes, dried peaches, and dried apricots from the United States, apples from the United States and Canada, figs from Asia Minor, dates from the Persian Gulf and North Africa, and nuts of various kinds from Europe, California, and South America. New South Wales imports chiefly apples and oranges. South Australia imports dried fruits, principally French prunes in jars, shelled and unshelled almonds from Europe, evaporated figs, prunes, and apricots from California, and

dried figs and dates from Asia Minor and Mesopotamia. Very little fruit of any kind is imported direct into Tasmania, but imported fruits are received there from other States, chiefly from New South Wales and Victoria.

The imports of fruits of various kinds into the Commonwealth of Australia in the calendar years 1912 and 1913 have been averaged in Table IV.

New Zealand.—The most promising outlook for imported fruits in New Zealand at present is for canned, dried, and preserved fruits; but there will always be a market for those fresh fruits which can reach New Zealand in the off season.

The figures in Table V give the fruit imports of New Zealand averaged for the years 1912 and 1913.

FRUIT IMPORTATION LAWS.

Australia.—All fruit imported into the Commonwealth of Australia is subject to the provisions of the quarantine act of 1908–1912 with regard to freedom from disease. Where imported goods are found to be diseased, the affected portion may be exported beyond the Commonwealth, provided the packages are plainly marked with a true description of the goods and the name of the country where they were produced.

The principal Australian law affecting the importation of fruits is a proclamation which appears in the Commonwealth Gazette, No. 38, dated March 26, 1919, under the quarantine act 1908–1915, which prohibits the importation of citrus plants (including citrus fruits) into Australia from any part of the world in which citrus canker or Japanese canker exists. This regulation was modified by a proclamation under the quarantine act, dated July 15, 1920 (Commonwealth Gazette, No. 60), so as to permit the importation of citrus fruits from California and Arizona, subject to the condition that each consignment is accompanied by an official certificate dated and signed by a responsible officer of a Government department of the country of origin, giving the name of the State in which it was grown, identifying the fruit, stating the quantity, and certifying (a) that the fruit was grown in the State specified, (b) that citrus canker does not exist in the said State, and (c) that the consignment is free from citrus canker and from all other diseases.

A proclamation dated July 19, 1917 (Commonwealth Gazette, No. 14), prohibits the importation of apples unless the consent in writing of the Minister of State for Trade and Customs has first been obtained. This amounted practically to a total prohibition, since it was extremely difficult for shippers to obtain transportation so far ahead as to be able to receive the written consent of the minister from Australia before shipping their goods. This proclamation was

modified by a proclamation effective May 19, 1920, under which the import prohibitions relating to apples ceased to operate.

Under the Commonwealth quarantine act of 1908-1915 the importation into Western Australia of apples, pears and quinces from any part of the world except the other States of the Commonwealth is prohibited. Under this act also the removal of apple, pear, and quince trees from any other Australian State into Western Australia and the removal of grapevines or any parts thereof from the States of New South Wales, Victoria, and Queensland into the States of South Australia and Western Australia is prohibited.

By the same act total prohibition also exists against the importation into Western Australia of walnuts shipped from or grown in California. However, by a special exemption, fruit or vegetables to be used solely for food may be imported into Western Australia at ports north of Geraldton, a coastal town lying about 300 miles north of Perth. The fact that any ports lying north of Geraldton would be in the Tropics and therefore unfit for apple or pear growing is probably the reason for the exemption.

Rules in regard to trade descriptions are also important. Regulations under the commerce act of 1905 provide that in the case of articles used for food by man there shall be applied to the goods, or where affixture to the goods is impracticable, to the coverings containing the goods, a notice giving a true description of the goods as well as the name of the country or place in which the goods were made or produced.

New Zealand.—Any fruit other than grapes, which may be imported from Australia alone, may be introduced into New Zealand, provided every shipment of fruit is accompanied by a certificate, signed by the shipper, giving the shipping marks and the number of packages of each class shipped under each mark, the name of the grower, the locality, country, or place of growth, and attesting that no species of fruit fly is known to exist in or within 1 mile of the orchard where such fruit was grown and that the fruit is contained in clean new packages not previously used for any purpose. Another certificate must be inclosed, signed by an officer of the Department of Agriculture or other department relating to horticulture in the country where such fruit was grown, to the effect that the fruit shipped is clean and free from disease and that no species of fruit fly is known to exist in or within 1 mile of the orchard where such fruit is certified by the shipper to have been grown.

The Agricultural Department in New Zealand examines all imported fruits free of charge, destroying whatever is affected with such diseases as codling moth, black spot, and fruit fly. To make this examination effective, the ports of Auckland, Wellington, Lyttelton, Dunedin, and The Bluff are appointed to be the only ports of entry for fruit.

METHODS OF MARKETING IMPORTED FRUITS.

Australia.—Practically all fruit from California and the Northwest coming into the Australian markets has been handled by one firm. Its representative operates on the Pacific coast, buying the fruit either direct from the grower or from an association, the terms usually being f. o. b. shipping point. This firm has practically had the control of the import fruit trade, as it has contracted for all the refrigerators of one steamship line and also for a large proportion of another company's cool-room accommodation. With these advantages, the association holds a strong position in the market and obtains high prices, for the Sydney public at least, will pay high prices for first-quality product.

Some space on one steamship company's liners has been used by other importers, but the space allotted is small. Again, some consignments have been carried on deck, but they rarely arrived in good condition.

At the markets the fruit is sold by a commission agent or by the Australian Fruit and Produce Association to the retailer. Sometimes another middleman enters, when fruit is bought to sell to the retailers in the country towns, and there are also times when a commission agent will buy from the association to sell again, but in most cases its course is from the grower to the middleman, to the retailer, to the consumer.

Sydney is the center for the marketing of American fruits, as all boats coming from America equipped to carry fruit make Sydney their terminus, and fruit destined for other ports must be transhipped. It is considered that the Fruit Exchange, Bathurst Street, Sydney, constitutes the leading fruit market. This exchange handles the bulk of the good fruit sold in Sydney. The markets of this exchange are owned and controlled by a company composed principally of fruit growers and fruit merchants.

Some of the fruit merchants operating in the Fruit Exchange buy the best grades of fruit from the agents and send it out into the country districts. These merchants must have the very best grades, as transportation to the country is likely to be slow, and the handling of perishable articles is of the poorest. The pack of the American fruit is so superior to the Australian pack that merchants prefer to pay as much as \$1.20 per case more for American fruit for the sake of getting it to its destination in good condition. They have tried to import American apples direct, but owing to their inability to obtain refrigeration their efforts were unsuccessful.

The municipal markets, Haymarket, Sydney, retail both vegetables and fruit and also do a wholesale business, but buyers of special lines are rather inclined to give their attention to the Fruit Exchange.

The markets are owned and controlled by the City Municipal Council, and the allotments of space cost more than at the Fruit Exchange. The municipal markets are comparatively new buildings, specially built for the purpose of their present use, and are in fairly close proximity to the railway station.

The methods of marketing vary little in the other States of the Australian Commonwealth, but as Sydney is the import center more attention has been paid in this report to its markets.

New Zealand.—There are about 26 fruit-importing firms in New Zealand, distributed among the provincial districts. The importers deal direct with American merchants. In making importations finance is usually met by an advance of a letter of credit on presentation of shipping documents in America, at per case or as arranged. Most of the American merchants prefer to sell outright, with payment when shipment is made, but complaints have been made by importers in New Zealand that this method presents too much opportunity to the unscrupulous few.

In some cases these importers handle the fruit on consignment, paying the American shipper pro-forma payment on all consignments and then selling the fruit privately and by auction, a large quantity going to retailers. All of the importers are willing to do this class of business. Imported fresh fruits are almost exclusively dealt in by fruit brokers on consignment. Sometimes several will place a combined order. Commissions vary from 7 to 10 per cent, but the most usual is $7\frac{1}{2}$ per cent.

The margin of profit for fruit importers is always fixed by supply and demand. When fruit is bought by agents in America it is paid for before shipment, but if shipped on consignment, the consignors usually draw for a proportion of cost, and the remainder is settled by bank draft after the fruit is disposed of.

It is generally believed that two firms practically supply the whole of New Zealand and arrange with the principal firms in each main center to sell at a fixed price, which plan works smoothly until some unexpected circumstance upsets demand and causes the fruit to be sold by auction at the retail buyers' idea of value, often showing heavy losses to shippers or buyers, as the case may be. There is a very loose organization between the different importers in New Zealand, but it seems to have no effect upon the import trade.

Not many wholesale fruit dealers operate in New Zealand. Auckland contains about 250 retailers and probably about 10 wholesalers, some of whom handle retail fruit as well. The facilities for doing business are those usual in this country for retailing any other commodity, and little is done to promote sales and market development work.

COST TO AMERICAN SHIPPERS.

A thoroughly useful discussion of costs of exporting fruits to these countries is not practicable, since the only available figures are pre-war or relate to times of abnormal conditions. However, a few illustrations are given as possible bases for estimates.

Australia.—Freight rates per ton for fruit carried as ordinary cargo by water between Melbourne and other Australian ports varied, in 1917, from \$3.41 to Sydney to \$17.35 to Port Douglas and Cooktown. Railway freight rates from Melbourne to various inland towns varied from \$1.38 for fresh fruits and \$4.93 for dried to Hamilton (43 miles) to \$6.54 and \$32.69 to Mildura (351 miles).

In addition to the ordinary transportation charges for fruit imported into Australia there must be added the charges for dockage, lighterage, transshipment dues and conveyance to the ultimate markets of distribution. These expenses vary with the different fruits. For apples imported through Sydney and Melbourne such dues and charges are about as follows:

Coastal rates of freight.

From Sydney, New South Wales, to—	Per ton of 40 cubic feet in dollars.	From Melbourne, Victoria, to—	Per ton of 40 cubic feet in dollars.
Melbourne, Victoria.....	3.41	Sydney, New South Wales.....	3.41
Brisbane, Queensland.....	5.17	Brisbane, Queensland.....	7.37
Adelaide, South Australia.....	5.54	Adelaide, South Australia.....	3.41
Albany, Western Australia.....	11.81	Albany, Western Australia.....	9.31
Fremantle, Western Australia.....	11.81	Fremantle, Western Australia.....	9.31

Dock dues (wharfage) at Sydney on direct importations not intended for transshipment are 73 cents per ton of 40 cubic feet. If transshipped within 48 hours the fee is 12 cents additional; if transshipped after 48 hours, 24 cents additional. Cartage for a double or pine case is 4 cents; for a bushel case 3 cents; for a half-bushel case 2 cents.

At Melbourne apples discharged in River Yarra are assessed a fee of 27 cents per ton of 40 cubic feet or 1.5 cents per case. Dock dues on direct importations not for transshipment, or if transshipped within 48 hours, are 80 cents per ton; after 48 hours of discharge the fee for transshipping is 24 cents, and an additional wharfage charge is made at final destination. Cartage per ton of 40 cubic feet at Melbourne is 60 cents. At Melbourne there is also a small lighterage fee: Overside minimum of 50 tons (thus saving sorting and packing charges), 72 cents; from wharf minimum of 25 tons, 84 cents.

New Zealand.—American fruit is imported into New Zealand through the San Francisco Mail Service direct to Wellington, and to Auckland direct from Vancouver via the Canadian Mail Service.

Wellington is connected with other coastal points, including Lyttelton, Auckland, Gisborne, Napier, and Dunedin, by both rail and steamer. The frequency of service varies and of course was somewhat irregular during the war.

Fruit reaching New Zealand from the Pacific coast is usually landed at either Auckland or Wellington, and the rate of coastal freight from either of these places to the other main ports, Lyttelton, Dunedin, or Napier, is approximately \$4.87 per 40 cubic feet. Harbor board transshipment charges depend upon the length of storage time incurred, but may be reckoned at about \$1.22 per 40 cubic feet. There are no arrangements for booking fruit through to inland points, but if transshipments are required there will be a further charge for cartage of about \$1.22 per 40 cubic feet, which will include cost of loading into railway trucks.

The rates from the Pacific coast to ports of call in New Zealand have varied considerably. Before the war they stood at about \$15 per 40 cubic feet, but since then they have advanced in proportion to the ruling rates on general cargo.

For the season of 1919 the "cold storage" rate was fixed at \$40, and the rates for "on deck" and "'tween deck" shipments were the same as the current general cargo rates.

POSSIBILITIES OF INCREASING AMERICAN TRADE.

The trade with Australia and New Zealand has reached its present dimensions largely because the exporters have faithfully endeavored to ascertain what Australia and New Zealand required and to discover and strengthen the weak links in the business. Every effort should be made to continue the trade on this basis.

Australia.—To develop the fruit trade with Australia much further it will be necessary for American growers to get into closer touch with the wholesale market men and to ship on consignment, thereby converting a narrow channel into a much broader one and effecting a more direct and less expensive method of marketing.

There are many limiting factors which should be carefully considered in connection with the development of this trade. One of the most serious is the present limitation of shipping facilities and the fact that space suitable for shipping fruit in this trade is practically all held by contract by one or two parties. Development of such facilities is one of the most urgent needs of the industry.

There has been a natural restriction on the American-Australian fruit trade because the Australian importer has had to figure his purchase profit based upon landed cost per case and has had to limit speculations in order to make this profit secure. The fact that fruit must be delivered in refrigerated chambers at certain seasons only, and the disinclination of American producers to consign fruit

except upon a straightout purchase have been other limitations. Practically the whole of the business between Australia and the United States has been on an f. o. b. basis, the shippers drawing against bank credit at port of shipment. These terms would be satisfactory if shippers always carried out their part of the contract according to instructions, but some Australian firms have lost large sums of money because instructions regarding varieties, sizes, and other requirements have not been observed by shippers.

The grading and packing of American fruit as received in Australia are excellent, but to conform to Australian grading laws the fruit must be marked A, B, or C, according to size and quality. Australian quarantine legislation also demands rigid inspection and certification of fruit.

At present only small shipments of fruits other than navel oranges, mandarins, lemons, and apples are recommended for Australia, and American fruits are allowed on the market only when there are no local deciduous or citrus fruits available. (See Table VI.) Sydney and Brisbane offer better opportunities for American fruits than Melbourne under present conditions. American apples almost always arrive in good condition, when shipped by steamers suitable for fruit carrying; they are well graded and of fine color. Oranges are shipped annually from California in November and find a ready market, but pears prove a very risky importation. Of the dried fruits, prunes, and apricots from California arrive in good order, but are considered inferior in size and quality to the locally grown fruit. Figs from America usually arrive in a more or less acid condition. Bottled olives are first class in every way.

New Zealand.—In New Zealand, especially, American apples find a ready sale, as they can arrive there only during the off season and the more farsighted producers are opposed to placing any embargo on imported fruit. Prospects are good for the increase of American apples in New Zealand if they can be landed from the Northern States, but at the present time Canada has preference on the mail steamers.

The best varieties of apples for the New Zealand market are King David, Jonathan, Esopus (Spitzenberg), Winesap, Missouri Pippin, Yellow Newtown (Newtown Pippin), McIntosh, Salome, and Delicious. A certain quantity of oranges and lemons will always be required, the home-grown lemon being very inferior at present to imported varieties. Grapes have so far proved unsatisfactory, owing to the distance to be carried, but if means can be found of landing them in a marketable condition they should find a ready sale. The grapefruit probably has the greatest opportunity, for although at the present time it is practically unknown in New Zealand, it seems likely to become popular.

The best grade and pack is essential for the New Zealand market. As regards size, apples should run from 150 to 225 and oranges from 126 to 250. The present case used for apples is suitable, but it is thought that a pack half the size of the case used at present for oranges and lemons could compete more readily with the Italian case.

Dried, canned, and preserved fruits will probably always command a market in New Zealand, and it seems probable that the United States will continue to hold first place, although with the growth of the home industry the demand for American products is likely to decrease, and there will probably be keen competition with Canada.

It is to the New Zealand of the future, of course, that American exporters should look rather than to the actual market of the present. With the gradual opening up of the country by settlement and increased transport facilities, and particularly with the growth of mutual understanding and friendly feeling between the two countries, a closer trade union between America and New Zealand seems certain.

Both Australia and New Zealand will offer promising fields for publicity campaigns with the usual tools of educational folders, posters and one or two agents, as rapidly as increased shipping facilities and a more definite policy regarding restrictions make it possible to fill an increased demand for fruit.

APPENDIX.

TABLE I.—*Production of fruits in the Commonwealth of Australia.*¹

[Average of 1914-1917.]

Fruit.	Unit of measure.	New South Wales.	Victoria.	Queensland.	South Australia.	West Australia.	Tasmania.	Total. ²
Apples.....	Bushel...	515,228	1,360,531	35,458	408,730	436,797	1,651,447	4,410,001
Apricots.....	do.....	72,472	194,318	3,667	129,203	28,404	72,876	501,045
Bananas.....	Bunch.....			1,106,968		32,440		
Cherries.....	Bushel...	54,749	62,272	422	26,185		5,527	149,207
Coconut.....	Dozen.....			24,743				24,743
Custard apples.....	Bushel.....			6,960				6,960
Figs.....	do.....	5,262	21,286	505	11,966	48,961		87,980
Lemons.....	do.....	210,130	59,071	11,848	21,781	25,731		328,561
Mangoes.....	do.....	68		86,401				86,469
Nectarines.....	do.....	(⁴)	7,774	3,668		12,865		24,307
Nuts.....	Pound.....	37,118	90,893	2,541	468,460			
Oranges.....	Bushel...	853,530	68,880	287,566	101,487	137,022		1,448,485
Passion fruit.....	do.....	55,170	9,143	5,231				69,544
Pawpaws.....	Dozen.....	³ 5		46,027				
Peaches.....	Bushel...	455,943	456,278	54,110	102,596	74,586	6,727	1,150,350
Pears.....	do.....	132,227	554,873	3,196	101,121	71,929	161,376	1,024,823
Persimmons.....	do.....	5,832		945				6,777
Pineapples.....	Dozen.....	4,156		869,668				873,824
Plums.....	Bushel...	117,769	228,023	9,929	88,490	48,307	46,346	539,011
Quinces.....	do.....	36,268	71,203	486	29,843	9,773	8,625	156,352
Raspberries..	100 lbs.....		4,847		2,252		31,967	39,066
Strawberries..	Quart.....		197,811	129,823	70,560	23,107	41,950	463,251

¹ Australia. Bureau of Census and Statistics. Production Bulletin, Nos. 9, 10, 11.

² The totals include the following average amounts of fruit produced in Federal Territory: 1,810 bushels of apples, 105 bushels of apricots, 52 bushels of cherries, 110 bushels of peaches, 101 bushels of pears, 147 bushels of plums, and 154 bushels of quinces.

³ Bushels.

⁴ Included with peaches.

⁵ Includes nectarines.

TABLE II.—*Exports of fruit from Australia.*¹

[Average for 1912 and 1913.]

Exported to—	Fresh fruits.				Dried Fruits.			
	Apples.	Citrus fruits.	Pine-apples.	Other fresh fruits.	Raisins, Sultanas.	Raisins, other.	Currants.	Other dried fruits.
	<i>Boxes.²</i>	<i>Pounds.</i>	<i>Boxes.³</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
United Kingdom.....	749,228	11,600	1	1,982,250	486,679	468,080	90,994	105,962
Canada.....					⁴ 116,760	⁴ 165,816	76,720	
Ceylon.....	4,832			86,800				
Fiji Islands.....	1,656			43,350				1,753
Hongkong.....	852			8,000				
India.....	9,610			12,050				⁴ 2,600
New Zealand.....	11,758	3,204,250	6,865	1,319,150	420,261	44,418	178,390	162,757
Straits Settlements.....	3,353			47,150				
Union of South Africa.....	11,365			35,400	62,077	71,662	57,958	⁵ 59,360
Other British colonies.....	369	10,550	⁵ 2	9,450	⁴ 3,456	⁴ 4,062	3,117	
Belgium.....	9,938			⁴ 49,600				
Denmark.....	4,239							
Germany.....	174,352			519,550				
Italy.....	609							
Sweden.....	2,885							
Philippine Islands.....	2,081	⁴ 11,400		23,350				
Argentina.....	41,162							
Brazil.....	22,213							
Uruguay.....	35,832							
East Indies.....	8,190			86,650			⁵ 56	5,330
Other countries.....	2,051	⁴ 5,700	⁵ 2	⁴ 36,600	7,580	4,482	⁵ 168	2,004
EXPORTING STATES.								
New South Wales.....	17,807	2,770,350	5,801	1,090,050	77,125	88,161	104,478	13,205
Victoria.....	299,513	461,400	1,066	1,471,250	839,080	250,482	185,776	152,992
Queensland.....	52	1,150	3	1,650	284	138	231	378
South Australia.....	84,823	12,000		260,550	121,328	336,853	121,804	100,168
Western Australia.....	43,205			444,200		28		14
Tasmania.....	651,220			979,400				46,412

TABLE III.—*Exports of fruits (fresh apples and pears) from New Zealand.*⁶

[Average for 1912 and 1913.]

Exported to—	Boxes.	Exported to—	Boxes.
United Kingdom.....	4,117	Uruguay.....	5,883
United States.....	⁵ 81	Friendly Islands.....	97
Canada.....	⁵ 1,408	Navigator Islands.....	102
Fiji Islands.....	114	Brazil.....	⁴ 184
Argentina.....	9,787	All other countries.....	13

¹ Australia. Bureau of Census and Statistics. Trade, Customs and Excise Revenue, 1912 and 1913.² Converted to United States equivalents on the basis that 1 box is equal to 50 pounds.³ Converted to United States equivalents on the basis that 1 box is equal to 80 pounds.⁴ 1913 only.⁵ 1912 only.

Dominion of New Zealand. Statistics, 1912 and 1913.

TABLE IV.—Imports of fruits into Australia.¹

[Average for 1912 and 1913.]

Imported from—	Dried fruits.					Fresh fruits.		
	Raisins, Sultanas.	Raisins, other.	Dates.	Currants.	Other dried fruits.	Apples.	Citrus fruits.	Bananas.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Boxes.</i> ²	<i>Pounds.</i>	<i>Pounds.</i>
United Kingdom..	1,158	28,044	939,774	5,034	235,922		31,247	
Canada.....					³ 19,150	14,510		
Hongkong.....					100,176		24,726	
Egypt.....		³ 93	34,662		⁴ 6,833		183,161	
India.....			520,454		³ 14,455			
Fiji Islands.....							¹ 22,308	30,274,850
New Zealand.....					5,058		24,437	
Straits Settlements.....	286			⁴ 224	7,028		23,693	34,650
Java.....								145,050
Aden.....			⁴ 546,828					
Other British colonies.....		1,237	7,965			56	³ 18,101	
Arabia.....			1,204,809		⁴ 4,217			
Asia Minor.....	29,196	3,776	2,144,299		218,416		41,386	
Belgium.....					34,770			
China.....			120		2,785		1,926	
France.....		8,463	32,260	15,149	73,509			
Germany.....	⁴ 11,674	⁴ 3,438	⁴ 95,577		29,086			
Italy.....	³ 5,683	3,499		⁴ 9,964	24,398		2,944,649	
Spain.....		50,399			2,811			
Turkey.....	313	7,117	377,704		65,415			
United States.....		20,727	⁴ 61,918		1,050,811	80,366	117,126	
Persia.....			1,179,582					
Greece.....	3,199	³ 13,367		134,886	⁴ 93		8,524	159,650
Other countries.....								
IMPORTING STATES.								
New South Wales.....	14,720	71,965	3,086,039	119,677	862,040	92,130	1,200,768	18,706,200
Victoria.....	24,580	17,798	2,034,931	27,123	334,189		1,107,774	11,722,550
Queensland.....	567	6,150	562,049	3,122	462,773	2,792	350,518	100
South Australia.....	313	5,289	614,472		74,564		42,329	
Western Australia.....	8,977	30,535	358,111	12,543	139,074		692,371	185,350
Tasmania.....	800		131,806	2,082	4,309	10	16,073	
Northern Territory.....	406		240	336	6,580		7,632	

TABLE V.—Imports of fruits into New Zealand.⁵

[Average for 1912 and 1913.]

Imported from—	Dried fruits.				Fresh fruits.				
	Figs, dates, prunes.	Currants.	Raisins, dried.	Plums, cherries, etc.	Apples and pears.	Grapes.	Lemons.	Bottled and preserved.	Fruit pulp.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Boxes.</i> ²	<i>Pounds.</i>	<i>Boxes.</i> ⁶	<i>Dozen.</i>	<i>Pounds.</i>
United Kingdom.....	703,249	27,845	14,404					1,654	9,803
Australia.....	43,664	171,156	433,005	312,395	9,851	67,427	5,979	5,700	41,915
Hongkong.....	63							1,173	
India.....	9,136							848	
Canada.....	³ 1,250		5,035	⁴ 482	14,556			³ 546	
France.....	2,479	12,516	⁴ 1,792					98	16,190
Spain.....	3,931		33,608						
Greece.....	58,142	1,675,588	163,109						
Italy.....			² 1,832				2,104	³ 74	
Turkey in Europe.....	375,863	111,566	181,593						
Asia Minor.....	541,026	182,654	1,024,710						
Arabia.....	510,898	³ 5,214	³ 3,052						
Persia.....	69,821								
Egypt.....	23,878								
Society Islands.....			² 1,620					⁴ 8	
Fiji Islands.....			⁴ 80	5,040	³ 26				
United States.....	845,933	³ 5,972	3,232,258	9,327	24,508		⁴ 1	94,788	
Singapore.....							72	71,935	
Holland.....									³ 34,419
Other countries.....	146		22					54	52

¹ Australia. Bureau of Census and Statistics. Trade, Customs and Excise Revenue, 1912 and 1913.² Converted to United States equivalents on the basis that 1 box is equal to 50 pounds.³ 1912 only.⁴ 1913 only.⁵ Dominion of New Zealand. Statistics, 1912 and 1913.⁶ Converted to United States equivalents on the basis that 1 box is equal to 84 pounds.

TABLE VI.—*Marketing seasons of home-grown fruit in Australasia.*

Fruits.	Queensland.	New South Wales.	Victoria.	South Australia.	Tasmania.	New Zealand.
Apples.....	All deciduous fruits, November to May.	December to May; stored till November.	All year.....	January to July; stored till November.	February to November; latter months from cold stores.	January to September.
Apricots.....		November to March.....	November and December.....	December and January.....	February to March.....	
Peaches.....		do.....	December to April.....	November to April.....	January to April.....	
Pears.....		January to June; stored till August.	February to September.....	December to May.....	February to September; latter months from cold stores.	
Plums.....	All citrus fruits, May to December. ¹	November to March.....	January to March.....	January to March.....	February to April.....	
Quinces.....		February to April.....	April and May.....	February and March.....	March to May.....	
Persimmons.....			January and February.....	Citrus fruits May to November.		
Nectarines.....				All the year.....		Varies.
Citrons.....	All the year, chiefly February and August.	Available all year.....	Main crop, June to September	May to December.....		March to October.
Lemons.....			June to September (Valencia late till Christmas).			
Mandarines.....						
Oranges.....						
Pineapples.....	All the year.	Harvest during summer months.				
Pomelos.....			May to September.....	September to November.....		
Passion fruit.....		October and November.....	December.....			
Loquats.....						
Mangoes.....	May to December.	November to March.....	November and December, and part of January.....	November to January.....	December to February.....	
Cherries.....		January and February.....	January.....	November and December.....	December and January.....	
Gooseberries.....			December and January.....	November and December.....	December to January.....	
Mulberries.....			Main crop, November and December.	do.....	November to February.....	
Raspberries.....	All the year.	November to February; picking continues all year.	December and January.....			
Strawberries.....		January to April.....	January to March.....	January to March.....		
Bananas.....		November to March.....	May to September.....	New season, March.....		
Currents.....		May.....	Winter months.....	New season, March.....		
Figs.....	November to May.		May to September.....			
Grapes.....			May to September.....			
Almonds.....						
Chestnuts.....						
Walnuts.....						

¹ All citrus fruits begin about April in north and extend to November and December in south.

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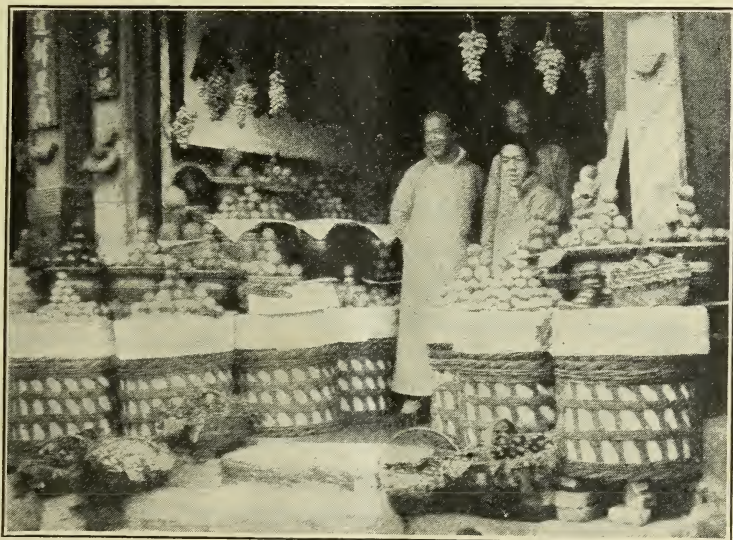
MARKETS FOR AMERICAN FRUITS IN CHINA

WITH RECOMMENDATIONS FOR AMERICAN
SHIPPERS

CLARENCE W. MOOMAW
Specialist in Foreign Marketing

and

MARJORIE L. FRANKLIN
Scientific Assistant



A Fruit Store in Peking

UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 146

Contribution from the Bureau of Markets
GEORGE LIVINGSTON, Chief

Washington, D. C.

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MARKETS FOR AMERICAN FRUITS IN CHINA.

With Recommendations for American Shippers.

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INTRODUCTION.

THE CLOSING of the fruit markets of the United Kingdom to imported products and the greatly reduced outlets to the European countries and South America during the war caused an active interest among the growers and shippers of the United States in the possibilities of developing markets across the Pacific. In view of the emergency which confronted the fruit industry by reason of the war, the Bureau of Markets of the Department of Agriculture undertook in 1917 to investigate at first-hand the fruit markets of the Far East in order, if possible, to discover new outlets and prepare the way for future development work there.

Growers and shippers of the Pacific coast fruits have long believed that somewhere in the Orient there was, or ought to be, a large outlet for their products. Generally it was assumed that since the purchasing power there was low, it ought to be matched with a low priced and necessarily, a low grade product, and the idea was entertained that if such produce were shipped to the principal ports, it could not fail to meet a ready and unlimited market.

The term "Far East" is a designation applied to those countries of Asia lying east of Persia, Arabia, India and Siam, and includes those bordering along the China Sea, the Yellow Sea, and the Japan Sea of the western Pacific Ocean. The countries of greatest interest to exporters of American fruits are China, the Philippines, Siberia, and Japan.

Of these, China now claims the chief interest of the American fruit industry. In the Philippines the establishment of trade in American fruits was coincident with the American occupation and the trade depends considerably upon the political status of the islands. Siberia at this time can be considered only as a negligible factor. The former source of its rich trade has been abolished and will have to be rebuilt under fundamentally new conditions. Japan, including Chosen, or Korea, is found to be a strong competitor of the United States in the fruit markets of the Far East and is of interest chiefly for that reason. This circular, therefore, is concerned primarily with conditions in China.¹

THE FRUIT INDUSTRY OF CHINA.

PRODUCTION.

The climatic range of China is comparable with that of the United States, but with more of a tropical character in summer. Deciduous fruits are grown abundantly in northern China, citrus fruit, pineapples, and bananas in southern China. Large orchards are not found but innumerable small ones produce a large aggregate of fruit. No attempt is made by the Government to estimate or record these crops; therefore, it is impossible to ascertain the annual production.

Of the native deciduous fruits, peaches are the most appreciated and pears are second. Pears and grapes are continuously on sale, being kept from one year to another by means of cold storage, the principles of which have been thoroughly understood and practiced in China for centuries. The fruit is stored in deep cellars with baskets of broken ice in order to maintain a low temperature.

Southern China exports considerable quantities of oranges to all points in the Far East. The Foochow district, which is one of the largest growing sections, produced approximately 5,000 tons of oranges in 1917 or, in terms of California equivalents, 138,889 boxes of 72 pounds each, a decline of 30 per cent from the 1916 crop. However, the 1917 crop was not up to the standard of average production. The crop of 1915 was estimated to be in excess of 11,000 tons, or 305,555 boxes. Most of the oranges find their way to north China ports, and up to January, 1918, the shipments of the preceding season from Foochow aggregated 2,750 tons. The first shipments for the year to the North were made in November.

¹ The original report of the studies conducted by the Bureau of Markets, contains detailed treatment of the fruit market possibilities of the Far East, the material being arranged in four parts under the heads of the countries mentioned in the preceding paragraph. The purpose of this circular is to set forth the situation in regard to China. For those who are interested in pursuing the subject further, the results of the investigation written in full are available in manuscript form in the files of the Bureau of Markets and may be borrowed upon request. Advantage is taken of this opportunity to acknowledge the cooperation of the American Consular Service and the Bureau of Foreign and Domestic Commerce, whose Far Eastern representatives rendered valuable assistance throughout the investigation.

MAP OF THE

STATE OF NEW YORK

AND ADJACENT PARTS OF

THE PROVINCE OF NEW JERSEY

AND THE DISTRICT OF COLUMBIA

AND THE DISTRICT OF MARYLAND

AND THE DISTRICT OF VIRGINIA

AND THE DISTRICT OF NORTH CAROLINA

AND THE DISTRICT OF SOUTH CAROLINA

AND THE DISTRICT OF GEORGIA

AND THE DISTRICT OF ALABAMA

AND THE DISTRICT OF LOUISIANA



FIG. 1.—Commercial map of China and vicinity.

The market in Peking during the month of September showed many varieties of apples, pears, oranges, pomeloos, pomegranates, persimmons, dates, jujubes, several varieties of grapes (including white, red, and purple), peaches, quinces and plums. Walnuts, chestnuts, other nuts, and peanuts were also on sale. Most of the above-mentioned fruits were being sold at prices that seemed low as compared with retail prices in the United States, but the fruits that had been transported long distances were naturally more expensive than those grown close to the market. Lemons were the only American fruit found in the market at this time. American apples reach Peking and Tientsin in limited quantities in November and later.

In Shanghai, on November 26, 1917, the official quotations of the public market included the following items, which are here given in terms of both Mexican and United States currency:

TABLE 1.—*The retail market at Shanghai for domestic and imported fruits.*

Product.	Unit.	Mexican.	Equivalent in U. S. currency.
Apples:		<i>Cents.</i>	<i>Cents.</i>
Chinese and Japanese.....	Pound.....	10-13	7.6- 9.8
United States.....	do.....	14-17	10.6-12.9
Canadian.....	do.....	16-20	12.1-15.2
Bananas.....	do.....	5- 6	3.8- 4.5
Coconuts.....	Each.....	15-16	11.4-12.1
Chestnuts.....	Pound.....	8-10	6.0- 7.6
Grapes.....	do.....	12-16	9.1-12.1
Lemons, American.....	Each.....	5- 6	3.8- 4.5
Oranges, native.....	Pound.....	6- 8	4.5- 6.0
Persimmons.....	do.....	6- 8	4.5- 6.0
Pomeloos.....	do.....	12-16	9.1-12.1
Pineapples.....	Each.....	8-10	6.0- 7.6
Pears.....	Pound.....	8-14	6.0-10.6
Walnuts.....	do.....	10-12	7.6- 9.0

The above quotations give a fair idea of the fruit supply and comparative prices in China at a season when American apples and citrus fruits are in the market. Chinese apples had practically disappeared at this time. The grapes and pears were from home storage stocks of north China. There were American oranges in the fruit stores, but at higher prices than those mentioned above. The summer fruits of China are abundant and cheap. They are grown locally almost everywhere. In their season of plenty, during summer and fall, native apples sell in Shanghai for less than \$2 Mexican for 50 pounds, or in terms of American equivalents, at approximately \$1.50 and less per bushel, according to exchange.

The Hongkong market conditions for October and November were somewhat the reverse of those noted in Peking. There were less of the northern or Cheefoo apples and pears and the prices were higher, while citrus fruits and bananas were more plentiful and cheaper than in the North.

EXPORTATION OF DOMESTIC FRUITS.

China engages in a considerable export fruit trade with the Far Eastern countries, and in certain fruits such as oranges and pears the future possibilities of the trade are believed to be excellent. A large part of this trade is with and through the British port of Hongkong, which serves as the chief distributing point.



FIG. 2.—Exterior of a Shanghai fruit store. This small shop sold more American apples than any other store in China during the 1916-17 season. For interior display see figure 3.

FRESH FRUITS.

During the six years 1912-1917 China's exports of oranges ranged from 333,839 boxes in 1912 to 243,706 boxes in 1917, a decrease of 27 per cent. Pears showed an irregular movement, increasing from 40,480 boxes in 1912 to 124,461 boxes in 1915, an increase of 207 per cent. Exports of this fruit fell to 72,373 boxes in 1917, which, however, still represented an increase over the export figures for 1912. Exports of all other fresh fruit decreased 37 per cent during this period. These decreases were caused largely by the increased cost of Chinese currency in exchange, the increase in the cost of goods for export being proportionate to the exchange.¹

¹ Figures are taken from Table 3 in original manuscript, based on China's Maritime Customs: Returns of Trade and Trade Reports (1913, 1915, 1917, Vol. I, Part III). Conversions on basis of 1 picul = 133½ pounds; 1 box oranges = 78 pounds; 1 box pears = 50 pounds; 1 ton = 2,000 pounds.

A large part of the export fruit trade of China is handled by the foreign houses at Shanghai and Hongkong. The fruit is crudely prepared for market and does not present an attractive appearance. It is cheap, however, even with the addition of the export tax of 5 per cent, and its cheapness together with the low charges for transportation, is a prime consideration in foreign markets where the purchasing power is relatively low.

DRIED AND PRESERVED FRUITS.

China also carries on a substantial export trade in dried and preserved fruit. The chief product is the dried persimmon, which ordinarily represents about 30 per cent of the total dried fruit trade. The Chinese statistics do not classify other dried fruits separately and it is impossible to show the exact extent of the trade. As in the case of fresh fruits, the trade in dried fruits is handled largely by and through Hongkong. Usually this port receives more than 50 per cent of China's exports. Large quantities, of course, are re-exported to other Far Eastern countries, but in the absence of statistics it is impossible to indicate the full amounts of Chinese dried fruits actually imported by the several countries.

IMPORTATION OF FRUITS.

FRESH FRUITS.

In the Chinese customs imports returns fruits are not classified, and it is impossible, therefore, to show separately the exact amounts of the several fruits received. However, for the purpose of indicating the extent of China's import trade in fresh fruits as a whole, a statement of the amounts and values of the imports by countries for the years 1910 to 1916, inclusive, is given in terms of American equivalents. Statistics are not available for the preceding years. (See Appendix, Tables 2 and 3.)

The outstanding feature of Table 2 is that China's import trade in fresh fruits has grown extensively since 1910, the first year for which statistics are available. The highest point reached was in 1913, when 29,248,000 pounds were received as compared with 8,602,789 pounds in 1910, thus registering an increase of approximately 240 per cent in a period of four years. A considerable falling off will be noted between 1913 and 1915, the decrease being 23 per cent. In 1916 the imports increased greatly, being little short of the peak in 1913.

The largest import trade in apples is with Japan and the second largest with the United States. Japan exported 18,476 boxes to China in 1911, the United States, 18,298 boxes; Japan's exports of

apples in 1915 amounted to 36,140 boxes, those from the United States to 13,689 boxes. The statistics for Japan are significant, representing substantial increases. The gain between 1911 and 1915 is approximately 96 per cent.

The citrus fruit trade with the United States is very small; still the United States customs records for the eight years ending June 30, 1917, show a steady increase. Imports of oranges in 1910 amounted to 312 boxes, in 1917 to 2,489 boxes; shipments of lemons increased from 1,999 boxes in 1913 to 6,665 boxes in 1917. In 1918 shipments of oranges remained about the same, 2,496 boxes, while the imports of lemons decreased slightly to 5,246 boxes.

DRIED FRUITS.

The Chinese import statistics do not classify the varieties for dried fruits. It is interesting to note (see Tables 4 and 5, Appendix) that during the period 1911-1916 China's imports of dried fruits steadily increased.

China draws its dried fruit supplies from many parts of the globe. Hongkong holds the predominating position in the trade, as the tables show. China received 79 per cent of its total imports of dried fruits from Hongkong in 1911 and 83.3 per cent in 1916. It should be remembered that both Hongkong and Macao act as intermediaries or reexport markets for the same overseas countries which supply China directly. The tables, therefore, do not represent the actual extent of the imports from those countries.

The position of Japan in the dried fruit trade with China is the reverse of its position in the fresh fruit trade. The trade is small and decreased more than 100 per cent in six years. It is known also that the Japanese trade through Hongkong and Macao is limited.

Practically no dried fruit has been sent to Chinese territory from Canada and Australia. The chief items contributed by the United States are dried apples, apricots, peaches, prunes, and raisins. More detailed information will be found in the section of this publication dealing specifically with American trade.

THE IMPORT DUTY ON FRUITS.

China's rate of duty on fruits is not sufficiently high to interfere with the development of the trade. For fresh and dried fruits the rate is 5 per cent ad valorem plus 5 per cent of the duty as a port charge, which means, for instance, in the case of a box of apples valued at \$2, a custom charge of 10½ cents. When it is necessary to use weights in calculating the value of a cargo net weight is employed.

The duty on preserved and canned fruits is as follows:

	Taels.	American equivalents at prevailing rate of exchange. ¹
Canned fruits (apples, pears, peaches, plums, apricots, grapes):		
For table use, 2½ pound cans, per dozen.....	0.065	\$0.069
For pies, 2½-pound cans, per dozen.....	.057	.060
Jams and jellies:		
1-pound tins, bottles or jars, per dozen.....	.060	.064
2-pound tins, bottles or jars, per dozen.....	.118	.125
Fruits, preserved, in glass bottles, jars, cardboard or wooden boxes, per picul of 133½ pounds.....	.650	.520

¹Conversions made according to the rate of exchange prevailing at Shanghai August 2, 1920, when 1 tael was worth \$1.06.

MARKETING IMPORTED FRUITS.

WHOLESALE FRUIT TRADE.

Wholesale distribution of imported fruits in China is different from the process in the United States. For the most part, the importers are the wholesalers. In many cases the large retailers engage in a wholesale or jobbing trade with small local dealers or with dealers at outports with whom they have continuous connections. But usually the importers sell direct to the retailers or their syndicates.

In considering the limited wholesale distribution in China it should be remembered that thus far the amount of fruit imported has been rather small, and that the sale of the products has been confined to the large shops of a few cities. As the volume of the trade increases it is reasonable to believe that those houses which engage in both a retail and jobbing business may develop into large wholesale distributing establishments and possibly in time may undertake to do their own importing.

RETAIL FRUIT TRADE.

In China, as in the United States, fruit is handled by a great variety of retail mediums, ranging from the humble peddler, whose capital is his load, to the well-organized, substantial caterer's establishment where the best of everything in the fancy goods line may be purchased. Imported fruits are found only in the best class of stores, as a rule.

In the large cities there are a few department and provision stores owned and operated by foreigners, but they handle only a small part of the fruit sales, even to the foreign population. Many of the Chinese stores cater primarily to foreigners and, because of low expense of operation, are able to and actually do sell for lower prices than the foreign stores.

The native fruits are handled entirely in baskets which are used almost exclusively in displaying fruit. These baskets are of various sizes and shapes and often of artistic design, which adds to the attractiveness of the display. (See cover design.) Here and there in the shops may be seen large earthen jars of antique appearance,

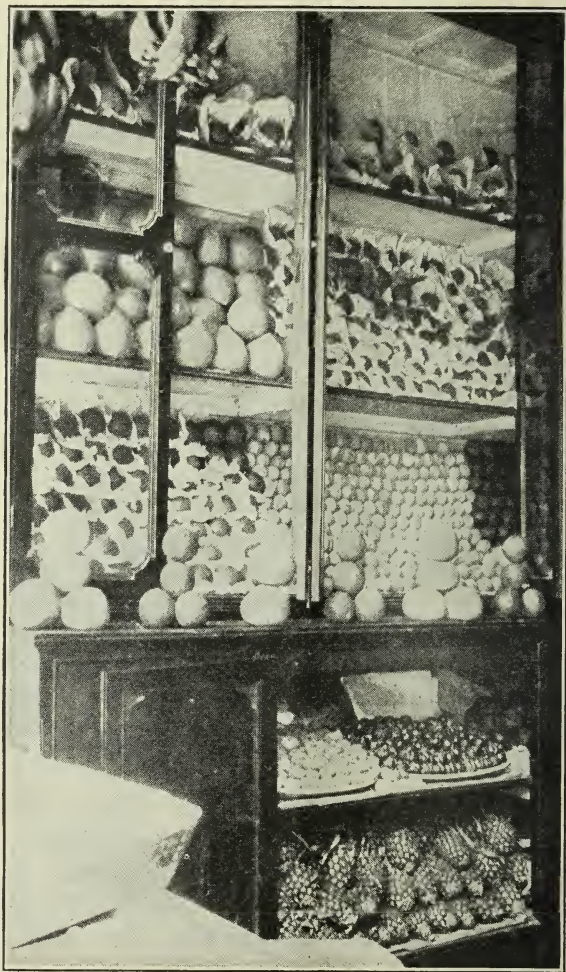


FIG. 3.—A display of fruit in the store shown in figure 2. Bottom shelf holds Amoy pineapples; second shelf, Chinese peaches and plums; third, American oranges and Shantung peaches; fourth, native pomeloos, oranges and lemons. On the ledge are California grapefruit and oranges.

which are the cold storages of the retail shop that keep the delicate fruits fresh and cool for the customers.

In the purchase of supplies the retailers, who have a satisfactory credit standing with the compradors, deal as a rule directly with the importers, who grant them liberal terms. Peddlers and small

traders who can not meet the requirements of the compradors buy in limited quantities from some native merchant who may have an intimate acquaintance with them. In many cities large numbers of the retailers purchase their supplies of fruits collectively through their syndicates. They seem to realize and appreciate fully the



FIG. 4.—The attractive display of a Canton store. All these fruits were native grown with the exception of the plate of wrapped apples, which were Californian.

benefits of cooperation, for which they are very keen. The organization and methods of the syndicates are expressive of the simplicity of the Chinese people. When the retailers find it too difficult to deal as individuals with the importers and their compradors they do not wait for the creation of an independent intermediary to serve them. They simply discuss the matter among themselves, combine in a

loose association, and delegate one or more of their number to secure an estimate of the general requirements. Then they buy in common. The activities of the organization cease when the purchasing is accomplished.

AMERICAN FRUIT TRADE WITH CHINA.

FRESH FRUITS.

The largest amount of apples sent to China from the United States in any one year was 24,784 boxes, or approximately 40 carloads. The varieties that meet with most favor are the Yellow Newtown, Esopus (Spitzenberg), and Winesap. The grade best suited to the trade is a good "Fancy" or No. 2, though an "Extra Fancy" is wanted in limited quantities, especially for the Christmas trade. The sizes liked best are 120s to 163s, but both larger and smaller sizes have reasonable demand and sale. As a pack, the standard Northwest apple box seems to be satisfactory for this trade.

The largest annual export of oranges to China was 2,489 boxes and of lemons 6,665 boxes. The export of citrus fruits, while not so large as that of apples, is more gratifying in that it shows a steady increase. All stores where American oranges were displayed had only the large and fairly large sizes, which contrasted favorably with the smaller native oranges. The sizes generally required for oranges are 126s and 150s, and for lemons 300s. The trade, however, has been taking small quantities of 176s in oranges and 360s in lemons.

DRIED FRUITS.

The chief demand for American dried fruits is found in the winter months. From October to April the goods can be stored and distributed successfully in the ordinary packages. For the rest of the year, however, because of the hot weather, canned goods are used almost exclusively. The grades required are from medium to best. The seedless rather than the seeded raisin is demanded almost entirely.

Statistics for all classes of dried fruits are not available prior to 1906. During the period 1906-1917 the prune trade ranked first, exports from the United States to China as a whole ranging from 75,058 pounds in 1908 to 208,554 pounds in 1917. Raisins rank next in importance, exports from the United States amounting to 66,871 pounds in 1906 and 82,055 pounds in 1917. During the 12 years the total quantity of dried fruits exported to China as a whole fluctuated considerably from year to year, but increased substantially as between the years 1906 and 1917, the advance in the trade being 138 per cent for the period.

Dried apples represented 27 per cent of the total dried fruits exported to China as a whole in 1906 and 14 per cent in 1917, thus

losing considerable importance during the period. The shipments fluctuated widely from year to year, but between the years 1906 and 1917 registered an increase of 23 per cent.

CANNED AND PRESERVED FRUITS.

Though the trade of the United States with China in preserved and canned fruits is limited, it has shown a gradual increase. The total trade with China in 1892 amounted to \$59,445; in 1917 this trade was valued at \$90,031 and in 1918 at \$103,958. The exports in 1892 were represented almost entirely by preserved fruits. But at the close of 1917 canned fruits greatly predominated, representing 93 per cent of the total trade in both canned and preserved products.

STORAGE AND INLAND TRANSPORTATION.

Cold storage is rarely used in China for imported fresh fruit. Practically all that is imported from America is on order, and there is usually a place for every package immediately upon arrival, so that the fruit goes into consumption without much delay. Usually the weather conditions are good for handling fruit when the first shipments are received in the fall and the ordinary storages, or godowns, are adequate for protecting the products for short periods until the importers are able to effect distribution.

Practically all of the large trans-Pacific lines have wharf and warehouse facilities of their own where the fruit may remain free of charge for periods of approximately 10 days. If the storage is required for longer periods, monthly rates will be quoted. Also there are independent storages which may be used. Some of the large importing houses have their own godowns and thus are independent of public storages.

It is fortunate that cold storage is not a necessity in the present stage of the trade, because the rates for such limited facilities as may be secured at the present time range from 25 to 50 cents per box per month. Small cold storages are operated in the largest cities in connection with the manufacture of ice. As trade in perishable products develops, cold storages will come to be a necessity, and it is reasonable to believe that in time adequate facilities will be available at reasonable rates. Cold storage at fair rates would be of considerable value at the present time, because it would enable importers to keep a supply of fruit on hand in anticipation of orders.

The inland transportation facilities for fruit are simply ordinary box cars and river steamers to the chief inland cities; but the fruit is transported successfully. Although fruit dispatch trains are never found, special facilities such as refrigerator and ventilated cars are sometimes provided. The prevailing cold weather in the northern regions during the importing season makes it impossible to deliver

the products with fair success in the ordinary Chinese way. No rates are published for fruit, but it is understood that ordinarily they are satisfactory. There is no Interstate Commerce Commission or similar agency to regulate rates, so changes without notice are frequent and the shipper must necessarily secure a rate for each shipment.

For the most part the exports have been handled by general export houses, which deal in a great variety of commodities and have branches or agencies in China or, with headquarters in the Orient, have branches or agencies in America. Some of the foreign importers,



FIG. 5.—Partial view of the modern municipally owned Hongkew Public Market at Shanghai. The city also operates the market. Produce of every kind and description, both domestic and imported, may be bought here.

having no agencies in America, simply arrange with brokers, growers, or shippers to fill orders.

POSSIBILITIES FOR DEVELOPING THE CHINESE MARKETS FOR AMERICAN FRUITS.

The potential demand in China is large. One-quarter of the population of the world is there. Wherever there are settlements of Caucasians, foreign fruits are demanded, and this demand is gradually extending among the Chinese themselves. The latter are great lovers and consumers of fruit, but under present conditions the masses are compelled to content themselves with the cheaper home-grown kinds. It should not be overlooked, however, that a great many Chinese of high official and business standing are abundantly able to buy any goods or fruits they wish. The increased wage-earning capacity of the native Chinese laborer now perceptible in much of the country, with its attendant benefits to all classes, together with the improve-

ment of inland transportation which is gradually developing, will inevitably enable a large proportion of the people to indulge in what are now luxuries beyond their reach.

PROSPECTS FOR FRESH FRUITS.

APPLES.

Prospectively, the market for apples is more susceptible of expansion than for other fruits. The quality of texture and flavor of the North American apple is so far superior to the Chinese and Japanese apple that it holds a distinct position in the trade. Aggressive action on the part of the shippers and importers carried out somewhat along

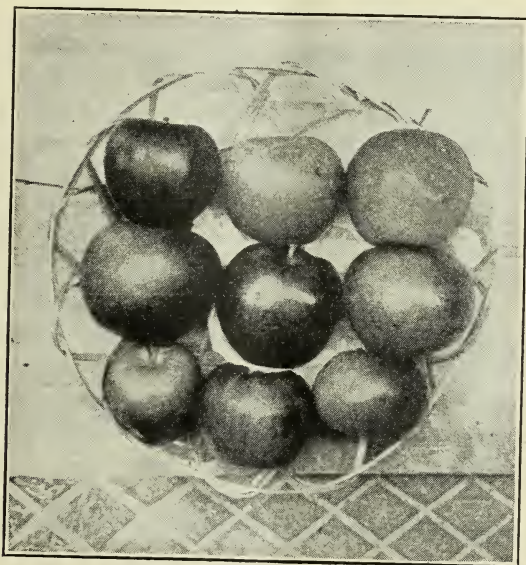


FIG. 6.—Basket of various apples from many countries found on sale in Shanghai in December, 1917. Top row, left to right, American Winesap, Newtown and Gano; middle row, Canadian Newtown, Esopus (Spitzenberg), and Cox Orange; bottom row, Chinese pearmain, Japanese Jonathan and California Newtown.

lines recommended later in this circular should secure a substantial increase from year to year, and in course of time, as China develops, should result in a trade of distinct value to the American apple industry.

In this connection the outlook as to competition with other countries which produce and export apples is worth considering. Apparently there will continue to be a strong competition of the cheap apples of poorer quality from Japan and Chosen, which even resident foreigners often purchase for cooking purposes, but these will not take the place of American and Canadian apples for dessert purposes. The extent of the Japanese industry and the competition from this source are treated in a separate section.

Canadian exports of apples to China are much less than those of the United States. The existence of this trade is based to a considerable extent on a feeling of loyalty on the part of the English in China for products of the "home country." Of greater importance is the fact that the excellence of the fruit commends it to the consumers generally. Imports of Canadian apples are all of high quality, such as the Jonathan, Grimes, Cox Orange, Esopus (Spitzenberg), and Yellow Newtown, whereas the imports of American apples consist of Ben Davis, Ganos, Winesaps, and Yellow Newtowns, the first-named variety predominating.

As fruit men of the Pacific Northwest are aware, British Columbia apples differ but little from apples grown in the United States and are in no way superior to them. The market prices are about the same at shipping points. It was found that in China, however, the Canadian apples generally sell at slightly higher prices than apples from the United States. The trade in China for Canadian apples is almost entirely in the hands of British stores, who prefer to handle an exclusive line in which the least competition is encountered. Their retail prices by the box range, in "Mexican," from \$2 to \$4 higher than is asked for apples from the United States. While the production of apples and the marketing arrangements in British Columbia are not comparable to those in the Pacific Northwest States, nevertheless the Canadians will undoubtedly present rather keen competition in the Chinese markets because of their foresight in introducing the best varieties and thus gaining a reputation for producing the best fruit.

DECIDUOUS FRUITS OTHER THAN APPLES.

Fresh American deciduous fruits other than apples have not reached China in noticeable quantities. At the present time, however, limited openings for some varieties of late pears and possibly cherries from the intermountain districts of the Pacific Northwest may be found, because of the superior texture of the deciduous fruit from that region. There is also the possibility of a small opening for the hardier varieties of California grapes, such as the Red Emperor and Malaga. A firm of importers at Shanghai, as the result of an interview with the representative of the Bureau of Markets, became considerably interested in the possibility of introducing American grapes and invited experimental shipments.

It should be realized, however, that for the present and near future any possibilities which may develop for deciduous fruits will be limited almost entirely to the Caucasian population. The Chinese production is rather bountiful, although the quality of the fruit is inferior to the quality of the American products.

CITRUS FRUITS.

The prospects for marketing American lemons and oranges are **not** encouraging at the present time. While the exports of these products to China have steadily increased in recent years, the advance is represented almost entirely by increased consumption among the Caucasian population. These fruits do not seem to gain much in popularity with the Chinese, who depend upon the domestic supply. It is extremely doubtful, therefore, whether the markets would respond appreciably to efforts to introduce American citrus fruit among the Chinese at any time in the near future.

PROSPECTS FOR DRIED AND CANNED FRUITS.

The lack of modern drying and canning establishments in China, and the relatively low prices of the American products as compared with the fresh fruits, together with the possibility of using even the crudest of Chinese transportation systems, all offer attractive opportunities for American dried and canned fruits. The well-to-do Chinese are becoming accustomed gradually to the use of these products and it is significant that the trade demands the best grades.

The drying and canning of fruits is not carried on extensively as an industry. The simple arts of drying are known and practiced, but a satisfactory product is not secured. Furthermore, the fruit-growing industry is not developed to the point where it would support the evaporating and canning of fruit on a commercial scale sufficient to make severe competition for American products. Raisins are not produced at all. The only canneries which pack fruits are at Amoy, Kiukang and Shanghai. Their chief output, however, consists of fish and meats, the fruit output being altogether insignificant.

As an indication of the possibilities for increase in the marketing and consumption of dried fruits, attention is called to the extensive advance in this trade which occurred between 1916 and 1917, as shown by Table 6, Appendix. During the latter year the trade became especially active and exceeded greatly the heaviest exports of any previous year. The rate of increase from 1916 to 1917 was 124 per cent for dried apples, 238 per cent for apricots, 394 per cent for peaches, 58 per cent for prunes and 9 per cent for raisins.

RECOMMENDATIONS FOR THE AMERICAN TRADE.

In developing the fruit market possibilities in the Far East much will depend on the methods pursued by the American industry. American exporters must pursue special methods in the case of China, where business systems are not susceptible to quick change or reform. In suggesting methods for procedure, the problems that will be encountered should be borne in mind. First of all, the proper selection, preparation and handling of the fruit must be considered.

Then the problems of transportation and adjustment of the supply are extremely important. Furthermore, sales arrangements, financing, establishing and maintaining trade-marks, advertising and market development work must be studied.

CAREFUL PREPARATION AND HANDLING.

Success in developing the markets of China for American fruits will be dependent largely upon the delivery of sound fruit, properly graded and packed. Aside from the careful selection of varieties, sizes and grades for individual market districts in China, emphasis is placed upon the extreme care necessary in picking and packing operations, and upon promptness in handling after picking so that

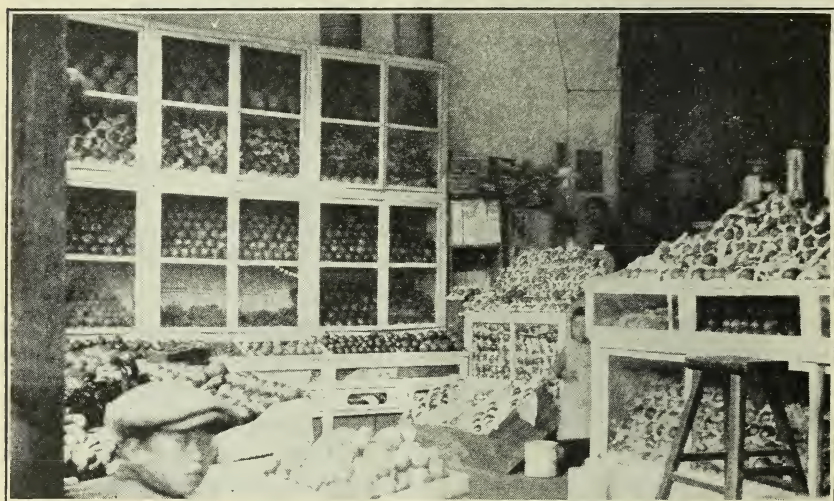


FIG. 7.—The neatness and orderly attractive appearance of this Shanghai fruit store are noteworthy. The cases which are faced with glass are designed not only for display but for the protection of the fruit from heat, dust, and flies. The best fruit rarely is displayed on open counters or at the front.

a minimum of time elapses between picking and shipment or storage.

The box shooks should be of good grade; all boxed fruits need to be packed firmly and the boxes require extra nailing and strapping at the ends to prevent breakage in handling. The loss from breakage does not seem to be sufficiently extensive to justify different or stronger packages than those now used on the Pacific coast.

Inspectors should be placed at the ship when it is being loaded to see that boxes are not piled on the bulge and that the cargo receives the proper stowing. Two by four dunnage should be nailed to the floor of the compartment and spaced so as to catch the ends of the boxes, thus leaving an air space underneath the load. At least a 2-inch space should be allowed between the boxes and the

side of the compartment, and spaces also should be allowed between all tiers of boxes, sufficient dunnage being used to insure a rigid load.

In the efficient control of the refrigerating compartment, the use of the thermograph will be of assistance in maintaining a greater degree of uniformity in the temperatures during the voyage. The maintenance of a uniform temperature of about 32° F. is desirable, allowing this to rise to 45° or 50° F. during the last day or two of the voyage. The ship's engineer should be kept informed of the temperatures recorded during the trip.

In the case of shipment in ventilated compartments, it is highly important to keep the temperature as low as possible. For this purpose bountiful spaces should be allowed at the top, bottom and sides, and at intervals within the load. If possible, forced ventilation should be maintained throughout the voyage, in order to keep the compartments flushed with cool, fresh air from the outside.

Looking to the extension of the trade and the possible necessity of carrying a stock of fruit in China, the exporters and importers ought to encourage in every possible way the operation of adequate cold storages at reasonable rates both at Hongkong and Shanghai. In time the coolers may prove to be valuable in equalizing the supply of fruit in the markets.

UTILIZATION OF EXISTING TRADE MEDIUMS.

In China the utilization of the existing trade channels is not only the proper course, it is the essential one. The national trait of pursuing trodden paths is not conducive to the introduction of innovations. China's conservatism is so noted that the wisest course is to follow the methods which have proved to be acceptable to the people with whom trade is desired.

It is suggested that the fruit shippers carefully select from among the importers at Shanghai and at Hongkong one firm to serve as the import agent for all. When the selection is made the agent should be allowed the widest possible powers under the uniform arrangements for all the shippers participating in the trade. The nature and extent of the market development work to be carried on by the agent, as well as all other essential terms, should be specified in contract form.

A number of the importers who have engaged in handling American fruits strongly urged the maintenance of an exclusive agency and were emphatic in their statements that satisfactory results can not be accomplished so long as the business is handled by a number of firms. They cited numerous cases in support of their conclusions and some of them stated that they had discontinued all activity in this trade as a result of the uncertainties caused by the old methods.

TERMS AND SALES.

It is believed best to conduct the trade in the beginning upon a wisely directed consignment basis, the shipments to be allocated among the various shippers and made upon the advice of the importing agent. Under this method the markets in China would be assured of a bountiful supply at all times; any losses would be distributed equitably among the shippers to be absorbed in the pools, and disastrous dumping, which so frequently results from open consignments, could be strictly avoided.

In lieu of open consignment, cost, insurance, freight terms would be the next best suited to market development work. Under this system the importing agent of the American shippers, if not handicapped by unduly high prices based on prevailing values in America, and if allowed discretionary powers, could solicit orders in advance of shipment at definite prices to be paid upon arrival of the goods in the Chinese port.

If the business is handled upon the basis described in the preceding paragraph, it should be clearly stipulated in the contract between the American shipper and the importer that the importer's remuneration is to be limited solely to an agreed commission. Otherwise, at times the temptation may arise of exacting an exorbitant margin of profit, thereby effectively obstructing the processes of trade expansion. At all times it ought to be remembered that the future of the trade will depend upon delivering the products to the consumers at relatively low prices.

In developing Chinese trade, *f. o. b.* terms will be the least effective. Under this method the Chinese merchants will not book orders in advance of shipment except as the importing agent may assume the responsibility of selling to them *c. i. f.* The burden of the transaction rests entirely upon him, and the business would become a buying and selling trade between the shipper and the importer. If this method were adopted the shippers virtually would register little progress and eventually would revert to the status quo of past times in so far as trade with China is concerned.

As a general rule Chinese credits are good. The American fruit shippers may find it of considerable advantage as a trade-promotion factor to allow the import agent and the Chinese merchants the most liberal credit possible. If the agent is required to remit before collections are made the trade naturally will be somewhat restricted.

If the merchants are required always to pay upon delivery, they are likely to seek more liberal competitive services. In this connection the possibilities of the "acceptance" form of draft are commended to the shippers. The "acceptance" is nothing more than an acknowledgment on the part of the consignee for the receipt of the goods and his promise to pay the amount of the bill within a specified time.

The "acceptance" draft with shipping documents attached may be handled by the shipper through his local bank just as an ordinary draft, thereby securing the funds when shipment is made. The advantage of this method would be very decided in developing the Chinese fruit markets by greatly extending the operating power of the import agent and the buying power of the Chinese merchant.

ESTABLISHING SPECIAL TRADE-MARKS.

It is of the utmost importance that the Pacific coast shippers adopt, establish and maintain special distinctive trade-marks for China. These trade-marks should show a striking design, with the customary



FIG. 8.—This show window maintained at Shanghai by a British department store contains Canadian apples, American biscuits, California canned fruits, etc.

description of contents printed in both English and Chinese. The trade-mark should be registered in China and also in Japan before it is used in the trade, because the laws of Japan give all rights to priority of registration rather than use.

The multiplicity of brands or "chops," as the Chinese call them, in the Pacific coast industry is confusing to foreigners and accordingly much of the advertising value is lost. Furthermore, in addition to the necessity of a uniform supply of fruit, it is highly important to make available to the Chinese trade a uniform supply of given brands of fruit. This is impossible when many different brands are used, as the majority of the shippers can not ship by every boat.

Thus maintained and controlled, year in and year out, without change of grades to meet seasonal conditions, the trade-mark would represent the fruit industry of the entire region rather than individual shippers, and therefore would be unaffected by the shifting fortunes of the individuals.

SUGGESTED MARKET DEVELOPMENT ACTIVITIES.

Fruit advertising or publicity campaigns would be of considerable value in developing markets. There are hundreds of newspapers published in many languages in China, and judicious use should be made of them, both in paid announcements and in news articles, in order that the consumers may be impressed properly with the numerous ways of utilizing fruit. Suitable films for moving-picture entertainments, showing surroundings incidental to orcharding in the United States, and phases of packing and handling, could be obtained and used to great advantage. In connection with all publicity the special brands should be featured. A wise and timely distribu-



FIG. 9.—A modern fruit store in Shanghai. The wide open front is typical. The display of fruit in the foreground is the bargain counter on which are placed defective fruits marked down to attractive prices. The best fruit is kept inside either in glass cases or earthen jars. The method of display is characteristic of practically all Chinese stores.

tion of apples as gifts and for use at special banquets or upon other occasions would appeal strongly.

SPECIAL REPRESENTATION IMPORTANT.

It is important that the Pacific coast fruit industry maintain a capable special representative in China to supervise the marketing and distribution of the products, and in cooperation with the import agent to carry on the necessary market development work. It ought to be remembered that import agents do not engage exclusively in the fruit business, that their interests are diverse, and that while they may handle specific sales successfully it would be too much to expect that they would concentrate adequately upon market development work for a particular product. A special representative to secure first hand information as to the disposition of the goods, to supervise the

work of the import agent, and to conduct a broad promotion policy, would be invaluable in this trade. The experience of the California canners and other American institutions marketing goods in China evidences the wisdom of such a course.

COOPERATION A NECESSITY.

The foregoing suggestions are made with a view to organized activities in developing the possibilities of the Chinese market. Individual growers and shippers, if acting separately, can not secure satisfactory results. The concentrated efforts of the fruit industry of a given region are essential, because otherwise it would be impossible to carry out a constructive program of work. The problems and hazards involved are too great for the individual. This is evidenced by the fact that shippers in the past have been altogether inactive in the Far Eastern trade. Strong organization is essential for applying the recommendations that have been outlined. Through cooperation, the burden of developing the markets would be distributed equitably without the discouragement which is incident to individual enterprise. In this connection the creation of new organizations is not recommended as necessary, but existing organizations are strongly urged to eliminate friction and loss of concentration.

JAPAN AS A COMPETITOR.

For many years the Japanese Government has been fostering and protecting the fruit-growing industry both in Japan and Chosen; first, by imposing practically prohibitive duties on foreign fruit and secondly, by furnishing nursery stock, and otherwise aiding the growers in perfecting and improving methods of culture and handling.

PRODUCTION.

Apple culture in the Japanese Empire is a rapidly growing industry. The combined production of Japan and Chosen in 1916 was 1,717,491 boxes, equaling approximately 2,860 American carloads. In 1906 the production of Japan proper had been approximately 1,562 American carloads, and this number practically represents the entire yield, both of Japan and Chosen that year, because at that time the production of Chosen was negligible. During the 11 years, therefore, the total production of the Empire increased approximately 83 per cent.

The principal varieties of apples grown in the Japanese Empire are Jonathans, Ralls (Rawle's Jenets), Ben Davis and Winesaps, all well-known varieties. However, close inspection is not required to show that these varieties grown in Japan do not maintain the characteristics of the American product. The quality is distinctly inferior. There seems to be something in the soil or climate that makes it impossible to produce apples of fine flavor; on young trees the fruit grows to good size, but on the older trees it is generally small.

The pear industry of Japan is of considerable importance. During the period 1910-1916 the total production increased 25 per cent, the crop of 1916 amounting to 4,073,253 boxes American measure. The value of the crop in 1916 averaged 64 cents per American box measure.

The citrus fruit industry of Japan appears to be enormous. In 1910 the number of citrus fruit trees, according to Japan's official statistics, was 19,876,840, as compared with 16,887,170 for the United States. But although the plantings in Japan appeared to be greatly in excess of the plantings in America, still the Japanese production falls far short of the production in the United States, which was placed by the census of 1910 at 23,502,128 boxes, while the Japanese statistics indicated a total production of approximately 6,200,000 boxes of American measure. The Japanese citrus fruit industry runs largely to oranges. Of these the mandarin greatly exceeds all other varieties combined. The production of lemons and grapefruit is negligible and no separate statistics are kept for them.

EXPORTATION OF FRUITS.

The operation of innumerable ships between Japan and continental Asia has enabled the Japanese exporter to place his fruits directly into all ports and inland cities at relatively low cost. The presence of numerous Japanese importers and dealers throughout the Orient has constituted an effective medium through which to promote markets for the Japanese products.

It is interesting to note that in trading with south China, Japan, unlike the United States, does not depend upon Hongkong as an intermediary. Kwantung Province, which lies just back of Hongkong, is next to the largest direct receiver of Japanese apples. This trade is handled largely through the city of Canton.

Between 1910 and 1915 the total exports of apples increased 50 per cent. The peak was reached in 1914, when 270,620 boxes, equaling approximately 450 American carloads, were exported. Of the total exports of 1915, China received 16 per cent, Siberia 76 per cent and the Philippines 5 per cent.

The export trade in citrus fruits is confined largely to mandarin oranges, and this is the only type officially recorded by the Japanese Government. During the period 1910-1915 the height of the mandarin trade was reached in 1913, when the equivalent of 472,164 American boxes were exported. This amount was absorbed largely by the two principal markets, Kwantung Province and Siberia, the former receiving 45 per cent, the latter 38 per cent. The trade with China exclusive of Kwantung Province is small, 24,079 boxes being the largest amount sent to that destination in any one year during the period 1910-1915.

During the same period Japan began a small trade with the Philippines and Australia. It is believed that the Japanese orange may grow to be a formidable competitor of the United States in these markets. In addition to the fact that Japan is a large producer and exporter of fruit, the policy of the Government apparently is designed to exclude or to discourage as far as possible the importation of foreign fruits. The policy seems to be accepted generally by the people and all efforts to introduce foreign fruits on a substantial scale into Japan have failed.

APPENDIX.

TABLE 2.—Quantity and origin of fresh fruits entered at Chinese ports, 1910-1916.¹

Countries.	1910	1911	1912	1913	1914	1915	1916
Fresh fruits.....	<i>Pounds.</i> 8, 602, 739	<i>Pounds.</i> 11, 673, 600	<i>Pounds.</i> 19, 626, 533	<i>Pounds.</i> 29, 248, 000	<i>Pounds.</i> 29, 289, 067	<i>Pounds.</i> 22, 519, 333	<i>Pounds.</i> 27, 620, 800
Australasia.....	² 14, 795	24, 400	18, 400				
Canada.....	² 15, 664	21, 332	28, 133	28, 933	25, 467	6, 000	53, 867
Hongkong.....	3, 385, 333	3, 644, 000	2, 925, 467	533	88, 800	30, 267	53, 067
Japan, including Formosa.....				3, 130, 000	5, 808, 534	3, 363, 200	4, 960, 000
Korea (Chosen).....	1, 757, 467	4, 831, 467	11, 385, 467	19, 973, 067	15, 933, 200	11, 393, 333	17, 754, 933
Macao.....	97, 067	136, 933	112, 400	234, 267	368, 933	179, 467	621, 600
Russia.....	861, 600	945, 333	1, 012, 800	1, 487, 733	2, 422, 667	2, 460, 933	962, 133
United States.....	2, 346, 660	1, 942, 134	3, 841, 067	4, 107, 733	4, 258, 400	4, 831, 866	2, 818, 800
All other countries...	² 119, 080	122, 000	271, 600	270, 667	304, 533	248, 800	379, 333
	5, 067	6, 000	29, 199	15, 067	28, 533	5, 467	17, 067

¹ This table includes reexports. Figures are based on China's Maritime Customs: Returns of Trade and Trade Reports (1911, 1914, and 1917), Vol. I, Part III. Conversion is on basis of 1 picul=133½ pounds.

² The Chinese official report gives no returns. The amounts here indicated are based on estimates made on the values given in Table 9, original manuscript.

TABLE 3.—Value and origin of fresh fruit entered from various countries at Chinese ports, 1910-1916.¹

Countries.	1910	1911	1912	1913	1914	1915	1916
Fresh fruits.....	<i>Dollars.</i> 185, 928	<i>Dollars.</i> 243, 625	<i>Dollars.</i> 433, 703	<i>Dollars.</i> 486, 023	<i>Dollars.</i> 508, 472	<i>Dollars.</i> 362, 571	<i>Dollars.</i> 534, 329
Australasia.....	1, 480	2, 444	1, 175				
Canada.....	1, 544	2, 103	1, 608	1, 685	1, 550	892	31, 169
Hongkong.....	55, 030	39, 346	37, 846	22	2, 135	1, 503	3, 118
Japan, including Formosa.....				40, 497	104, 364	40, 434	74, 766
Korea (Chosen).....	42, 650	94, 336	220, 013	289, 311	219, 834	155, 534	285, 682
Macao.....	1, 809	2, 710	3, 018	4, 972	7, 727	3, 252	18, 138
Russia.....	7, 698	8, 297	10, 679	19, 555	39, 938	32, 117	14, 287
United States.....	56, 552	77, 578	133, 485	106, 965	113, 394	111, 627	84, 517
All other countries ..	15, 652	16, 036	24, 099	20, 566	16, 789	17, 272	51, 112
	3, 513	516	780	2, 456	2, 741	440	540

¹ This table includes reexports. The value represents cost in the countries of origin. The Chinese statistics, from which the above table is compiled, are in terms of haikwan taels. In translating the value for the imports, the following rates of exchange of the tael were observed for the several years: 1910, \$0.66; 1911, \$0.65; 1912, \$0.74; 1913, \$0.73; 1914, \$0.67; 1915, \$0.61; 1916, \$0.83. Figures are based on China's Maritime Customs: Returns of Trade and Trade Reports (1911, 1914, 1917), Vol. I, Part III.

TABLE 4.—*Quantity and origin of dried fruits entered at Chinese ports, 1911–1916.*¹

Countries.	1911	1912	1913	1914	1915	1916
	<i>Pounds.</i> 10,348,305	<i>Pounds.</i> 11,667,700	<i>Pounds.</i> 11,681,966	<i>Pounds.</i> 12,008,751	<i>Pounds.</i> 11,717,200	<i>Pounds.</i> 14,433,200
Dried fruits.....						
Australasia.....	² 31,682	² 11,300	² 41,837	² 3,232	267	134
Canada.....	² 90		² 62	1,600		
Hongkong.....	8,176,267	9,050,133	10,289,600	10,563,500	10,201,200	12,016,267
Japan, including Formosa.	596,533	410,267	218,400	121,600	337,733	476,533
Korea (Chosen).....	28,533	1,067	3,200	43,333	18,667	28,133
Macao.....	987,733	656,133	724,267	775,600	720,000	1,561,333
Russia.....	281,467	1,176,133	157,200	125,733	227,866	58,533
United States.....	104,933	182,267	120,533	98,933	98,667	177,200
All other countries.....	141,067	180,400	163,867	275,200	112,800	115,067

¹ This table includes reexports. Figures are based on China's Maritime Customs: Returns of Trade and Trade Reports (1911, 1914, 1917), Vol. I, Part III.

² The trade returns of China give no returns. Amounts are based on estimates made or values given in Table 14, original manuscript.

Conversion of the picul is on the basis 1 picul=133½ pounds.

TABLE 5.—*Value of dried fruits entered at Chinese ports, 1911–1916.*¹

Countries.	1911	1912	1913	1914	1915	1916
	<i>Dollars.</i> 467,696	<i>Dollars.</i> 555,234	<i>Dollars.</i> 560,113	<i>Dollars.</i> 603,695	<i>Dollars.</i> 417,926	<i>Dollars.</i> 674,993
Dried fruits.....						
Australasia.....	3,897	1,400	595	400	33	12
Canada.....	38		26	671		
Hongkong.....	331,538	402,222	453,278	482,448	339,952	564,130
Japan, including Formosa.	11,512	9,677	10,700	13,357	17,453	19,595
Korea (Chosen).....	562	43	350	815	1,042	519
Macao.....	46,570	27,160	29,979	33,917	27,605	51,788
Russia.....	23,223	63,148	17,623	13,720	14,132	8,441
United States.....	20,573	26,051	24,540	28,380	8,661	17,256
All other countries.....	29,783	24,933	23,022	29,987	9,047	13,282

¹ The table includes reexports. The values represent costs in the countries of origin. The figures are based on China's Maritime Customs: Returns of Trade and Trade Reports (1911, 1914, 1917), Vol. I, Part III. Conversion of the haikwan tael for the several years has been on the basis of the following rates of exchange: 1910, \$0.66; 1911, \$0.65; 1912, \$0.74; 1913, \$0.73; 1914, \$0.67; 1915, \$0.625; 1916, \$0.79.

TABLE 6.—*Exports of dried fruits from United States to China proper and Hongkong, 1906–1918.*

[From the customs returns in the United States Commerce and Navigation Reports.]

Year.	Dried apples.			Dried apricots.			Raisins.		
	China proper.	Hong-kong.	China as a whole.	China proper.	Hong-kong.	China as a whole.	China proper.	Hong-kong.	China as a whole.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
1906.....	41,412	25,459	66,871	10,921	1,973	12,894	35,241	10,430	45,671
1907.....	50,237	15,535	65,772	6,415	900	7,315	51,130	11,957	63,087
1908.....	10,994	10,950	21,944	2,265	540	2,805	21,421	14,228	35,469
1909.....	19,935	16,000	35,935	4,044	2,235	6,279	24,808	16,791	41,599
1910.....	24,875	14,460	39,335	4,675	4,400	9,075	24,925	46,525	71,450
1911.....	22,950	13,895	36,845	6,210	3,450	9,660	34,950	19,385	54,335
1912.....	30,517	9,650	40,167	9,358	4,575	13,933	36,260	50,423	86,683
1913.....	37,400	18,400	55,800	23,690	7,795	31,485	56,253	62,477	118,730
1914.....	35,725	18,470	54,195	12,571	5,450	18,021	85,107	41,741	126,848
1915.....	23,840	10,475	34,315	16,883	3,645	20,528	48,925	65,017	113,942
1916.....	22,055	14,595	36,650	22,497	7,146	29,643	50,202	81,089	131,291
1917.....	70,680	11,375	82,055	19,627	80,530	100,157	77,393	65,904	143,297
1918.....	50,290	15,926	66,216	41,306	11,593	52,899	179,313	121,111	300,424

TABLE 6.—Exports of dried fruits from United States to China proper and Hongkong, 1906–1918—Continued.

Year.	Prunes.			Dried peaches.			Total.		
	China proper.	Hong-kong.	China as a whole.	China proper.	Hong-kong.	China as a whole.	China proper.	Hong-kong.	China as a whole.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
1906.....	86,822	23,375	110,197	14,188	960	15,078	188,514	62,197	250,711
1907.....	67,233	13,888	81,121	4,170	145	4,315	179,185	42,425	221,610
1908.....	58,178	16,880	75,058	770	180	950	93,448	42,778	136,226
1909.....	56,730	23,640	80,370	1,550	75	1,625	107,067	58,741	165,808
1910.....	54,435	21,680	76,115	2,000	650	2,650	110,910	87,715	198,625
1911.....	55,965	23,141	79,106	3,844	325	4,169	123,919	60,196	184,115
1912.....	55,111	24,085	79,196	4,465	1,310	5,775	135,711	90,043	225,754
1913.....	129,880	28,807	158,687	17,110	1,894	19,004	264,333	119,373	383,706
1914.....	73,865	29,305	103,170	7,125	965	8,090	214,393	95,931	310,324
1915.....	80,072	22,382	102,454	12,861	400	13,261	182,581	101,919	284,500
1916.....	97,699	34,545	132,244	11,090	1,773	12,863	203,543	139,148	342,691
1917.....	171,325	37,229	208,554	62,555	950	63,505	401,580	195,988	597,568
1918.....	157,242	38,505	195,747	20,973	1,146	22,119	449,124	188,281	637,405



THE WORK OF THE HUNTLEY
RECLAMATION PROJECT EXPERIMENT
FARM IN 1919

By DAN HANSEN
Farm Superintendent



Harvesting Oats on the Huntley Experiment Farm in 1919

UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 147

Contribution from the Bureau of Plant Industry
(Office of Western Irrigation Agriculture)
WM. A. TAYLOR, Chief

Washington, D. C.

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THE WORK OF THE HUNTLEY RECLAMATION PROJECT EXPERIMENT FARM IN 1919.

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EXTENT AND CHARACTER OF THE WORK.

The work of the Huntley Experiment Farm consists of experiments in the production of crop plants of local importance and also experiments in the feeding and care of live stock. The farm was established in 1909 on a tract of about 300 acres of public land, part of which is irrigated, while part of it lies above the irrigation canal and is used for experiments in the production of dry-land crops. The farm is operated cooperatively by the United States Department of Agriculture and the Montana Agricultural Experiment Station and is under the supervision of the Office of Western Irrigation Agriculture of the Bureau of Plant Industry. The Office of Dry-Land Agriculture, the Biophysical Laboratory, and other offices of the Bureau of Plant Industry as well as the Dairy Division and the Animal Husbandry Division of the Bureau of Animal Industry are cooperating in the investigational work.

The work with live stock was not begun until 1917, when the necessary equipment and stock were provided for carrying on experiments with dairy cattle and hogs.

This report treats of the results of the experiments with irrigated crops and covers some of the results of the pasturing and feeding experiments with live stock.

EXPERIMENTS WITH CROPS.

Experiments with irrigated crops include (1) crop rotation, (2) test of pasture grasses, (3) pasturing tests, (4) cropping methods, (5) tests of crop varieties, (6) experiments with sugar beets, (7) experiments with silage crops, and (8) tests of fruit trees and small fruits.

EXPERIMENTS WITH LIVE STOCK.

The experiments with live stock consist of (1) tests of the carrying capacity of different pasture mixtures with dairy cattle, (2) comparative feeding tests of corn and sunflower silage for dairy cattle, (3) tests of various grain rations supplementary to alfalfa pasture for hogs, and (4) tests of various feeds for finishing hogs in the dry lot. Tests for advanced registry are being conducted with the pure-bred Holstein cattle. In these tests the cows are fed during one lactation period on roughage consisting of grass pasture alone during the growing season of about 5 months and alfalfa hay and silage for the remaining 7 months, and during another lactation period they are fed complete rations of roughage and grains. Not enough of these tests have been completed to make available any data on the comparative production of cows under the two methods of feeding.

In connection with the dairy work, pure-bred bulls, sons of the highest producing cows, are loaned to farmers on the Huntley project under condition that herds in which these bulls are used shall be kept tested and free from disease and also that milk and feed records shall be kept. It is apparent that this feature of the work is much appreciated by local dairymen, and it is thought that this will be a means of increasing interest in dairying and be of much benefit locally in improving dairy stock.

CONDITIONS ON THE PROJECT.**CLIMATIC CONDITIONS.**

During the months of April to August, inclusive, the rainfall was only 2.84 inches as compared with 7.56 inches, the normal for the past nine years. The total annual precipitation was 12.22 inches, while the normal for the past nine years was 13.97 inches. During the months of June and July unusually hot weather occurred and a maximum of 107° F. was recorded, which is the highest since the farm was established. The frost-free period extended from May 7 to September 27, or a total of 142 days. The average frost-free period the past nine years was 129 days.

The climatological observations in detail, as recorded during the nine years from 1911 to 1919, inclusive, are given in Table I. The weather record observations were made in cooperation with the Biophysical Laboratory of the Bureau of Plant Industry.

TABLE I.—Summary of climatological observations made at the Huntley Experiment Farm for the 9-year period from 1911 to 1919, inclusive.

PRECIPITATION (INCHES).

Item.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Average for 9 years, 1911 to 1919.....	0.64	0.23	0.66	0.86	2.21	2.39	1.29	0.81	1.65	1.51	0.86	0.83	13.97
For 1919.....	.22	.35	.67	.54	.83	.21	.63	.63	2.47	2.61	1.96	1.10	13.92

EVAPORATION (INCHES).

Average for 9 years, 1911 to 1919.....				3.549	4.818	6.437	7.643	6.763	4.209				32.632
For 1919.....				5.072	6.454	9.253	9.336	6.932	4.378				41.425

DAILY WIND VELOCITY (MILES PER HOUR).

Highest:													
1911 to 1919.....	16.5	14.1	13.3	17.8	17.5	10.2	8.6	7.3	10.5	29.4	25.0	26.6	.....
For 1919.....	13.2	10.1	9.3	13.1	8.8	7.5	6.6	7.3	10.5	29.4	25.0	12.5	.....
Lowest:													
1911 to 1919.....	.3	.8	.5	* 1.0	.9	.4	.3	.3	.4	.8	.5	.1	.....
For 1919.....	2.0	1.5	.8	1.7	2.6	2.7	1.6	1.9	1.5	.8	.5	.3	.....
Mean:													
1911 to 1919.....	5.4	4.7	4.5	5.5	5.1	4.1	3.4	3.3	3.7	4.1	4.4	5.0	.....
For 1919.....	6.5	4.8	4.5	5.9	4.9	4.4	3.7	3.4	3.9	4.7	6.3	5.1	.....

TEMPERATURE (°F.).

Absolute maximum:													
1911 to 1919.....	65	63	74	87	99	107	103	100	94	85	71	63	.....
For 1919.....	65	62	71	79	99	107	102	98	87	80	59	51	.....
Absolute minimum:													
1911 to 1919.....	-39	-38	-27	12	22	34	38	34	24	-10	-21	-41	.....
For 1919.....	-16	-13	-11	22	29	34	41	42	28	-10	-20	-41	.....
Mean:													
1911 to 1919.....	17	21	32	46	54	64	70	68	56	44	33	* 21	.....
For 1919.....	33	20	31	47	58	70	73	71	59	35	24	15	.....

KILLING FROSTS.

Year.	Last in spring.		First in autumn.		Frost-free period (days).
	Date.	Minimum temperature (°F.).	Date.	Minimum temperature (°F.).	
1911.....	May 26	32	Sept. 18	28	114
1912.....	May 12	28	Sept. 15	31	125
1913.....	May 5	31	Sept. 19	29	136
1914.....	May 12	32	Oct. 6	31	146
1915.....	May 21	32	Sept. 19	32	120
1916.....	May 16	30	Sept. 13	31	119
1917.....	May 31	31	Sept. 28	32	119
1918.....	May 21	32	Oct. 7	28	138
1919.....	May 7	29	Sept. 27	32	142
Average.....	May 17	—	Sept. 17	—	129

CROP CONDITIONS.

The season of 1919 was unusual in many respects and was rather unfavorable for the growth of some of the farm crops. Conditions of extreme drought prevailed during the growing period and also during the preceding winter, with a consequent shortage of water for

irrigation during a part of the season. Perhaps the greatest loss occurred through lack of sufficient moisture in the soil early in the season to germinate seeds. In ordinary years the natural rainfall is sufficient to start the crops, and irrigation is not necessary until crops are up. Continued drought after the crops were planted made irrigation necessary to provide moisture for germination, which proved to be a difficult operation because of the heavy nature of the soil. This resulted in poor stands of grain crops and entire failure in many cases to secure a stand of sugar beets. The acreage planted to beets was only about half that of former seasons, and the failure to obtain satisfactory stands resulted in a further reduction of about 50 per cent in the acreage. The first and third cuttings of alfalfa were exceptionally good, and although the water shortage reduced the yield of the second crop, the total production for the season was above the average. Unfavorable weather conditions during the fall interfered seriously in the harvest of sugar beets and potatoes, and less than the usual amount of fall plowing was accomplished.

The acreage, yields, and farm values of crops on the Huntley project in 1919 are shown in Table II, the figures being furnished by the United States Reclamation Service.

TABLE II.—*Acreage, yields, and farm values of crops produced on the Huntley Reclamation Project in 1919.*

Crop	Area (acres).	Unit of yield.	Yields.			Farm values.		
			Total.	Per acre.		Per unit of yield.	Total.	Per acre.
				Average.	Maximum.			
Alfalfa hay.....	7,045	Ton.....	18,713	2.65	6	\$19.66	\$367,898	\$52.22
Alfalfa seed.....	146	Bushel....	283	.94	10	13.00	3,679	25.20
Apples.....	12	Box.....	302	25.16	.....	1.50	453	37.75
Barley.....	267	Bushel....	5,354	20.05	60	1.68	8,995	33.69
Beets, sugar.....	1,136	Ton.....	12,015	10.58	20.1	10.00	120,150	105.77
Beets, stock.....	94	.....	(¹)	.....	.....	.....	(¹)	.....
Clover hay.....	56	Ton.....	123	2.20	3	13.88	1,707	30.50
Clover seed.....	188	Bushel....	839	4.46	7.5	10.62	8,910	47.39
Corn.....	179	do.....	5,046	28.19	60	1.53	7,720	43.11
Garden.....	176	.....	.....	.....	.....	.....	20,080	114.09
Oats.....	1,977	Bushel....	58,707	29.69	93.5	1.16	68,000	34.40
Pasture, summer.....	1,389	.....	.....	.....	.....	.....	16,580	11.94
Pasture, winter ²	16,733	.....	.....	.....	.....	.....	65,834	3.94
Potatoes.....	40	Bushel....	4,781	119.70	300	1.77	8,462	211.55
Wheat.....	6,518	do.....	103,149	15.82	64	2.37	244,463	37.51
Miscellaneous.....	138	.....	.....	.....	.....	.....	6,037	43.75
Oat.....	52	.....	.....	.....	.....	.....	(³)	.....
Wheat.....	146	.....	.....	.....	.....	.....	(³)	.....
Total.....	19,310	.....	.....	.....	.....	.....	948,968	.....
Average.....	.....	.....	.....	.....	.....	.....	.....	49.14

¹ No yield; no value. ² Beets, alfalfa, wheat, oats, etc. ³ No crop value; included in above report.

The total cropped area of 19,310 acres remained about the same as in 1918, although the total farm valuation of crops produced was nearly one-fourth higher, due mainly to the increased prices received

per unit of yield. Alfalfa and wheat were the principal crops grown, these two crops occupying more than two-thirds of the total cropped area. While the acreage of sugar beets was low as compared to former seasons, the yield per acre of 10.68 tons was more than 2 tons higher than the yield in 1918. The average farm value per acre of all crops was \$49.14, as compared to \$39 in 1918.

LIVE STOCK.

The number of cattle, hogs, and sheep kept on project farms in 1919 increased slightly over the previous year, the principal increase being in the number of beef cattle and hogs. The value of hogs, even with the increased number, was less than in 1918, owing to the decline in market values during the latter part of 1919. The total value of all live stock amounted to \$73,280 more than in 1918.

Conditions on the project appear to be especially favorable for dairying, although the growth of this industry has been rather slow in recent years, owing to unsettled conditions and unusually high prices received for hay and grain crops. There appears to be a decided tendency for improvement in the grade of dairy stock kept on the project farms, and a few herds of excellent pure-bred Holsteins are being developed.

The total number and value of live stock on the project in 1919 is shown in Table III. This information was furnished by the United States Reclamation Service.

TABLE III.—Live stock on the Huntley Reclamation Project in 1919.

Item.	Inventory, Jan. 1.			Inventory, Dec. 31.			Increased or decreased total value.
	Number.	Average value.	Total value.	Number.	Average value.	Total value.	
Horses.....	2,120	\$108.70	\$230,435	2,297	\$110.00	\$252,670	\$22,235
Mules.....	51	197.16	5,465	46	81.50	3,749	— 1,716
Cattle:							
Beef.....	1,813	51.03	92,517	2,631	47.70	125,498	32,981
Dairy.....	1,923	60.18	115,726	2,040	62.30	127,092	11,366
Sheep.....	1,130	13.41	15,153	2,115	8.40	17,766	2,613
Hogs.....	2,391	18.07	43,205	3,097	13.64	42,242	— 963
Fowls.....	15,856	.52	8,245	21,456	.66	14,162	5,917
Bees, hives.....	424	3.78	1,603	458	5.35	2,450	847
Total.....			512,349.			585,629	73,280

CROP-ROTATION EXPERIMENTS.

A rather extensive series of crop-rotation experiments¹ under irrigation was started on 70 quarter-acre plats in field K in 1912, and continued each year since that time without change. Some additional rotations were begun in 1916 on 27 quarter-acre plats in

¹ An outline in detail of the experiments has been given in a previous publication. (See Dept. Cir. 86, entitled "The Work of the Huntley Reclamation Project Experiment Farm in 1918.")

field L-IV. In these experiments seven crops of the most importance locally are grown in various sequences, in eleven 2-year, five 3-year, four 4-year, and six 6-year rotations. In addition, each crop is grown continuously each year on the same plat. The crops grown in these experiments are alfalfa, oats, wheat, sugar beets, potatoes, corn, and flax.

The purpose of these crop-rotation experiments is to determine the effect on crop yields of various crop sequences, to learn the value of alfalfa in a rotation, and to obtain some definite measure of the value of manure when applied to certain crops. Results covering a period of eight years are available from the experiments in field K, and some significant differences in crop yields as a result of the different crop sequences and of the effect of alfalfa and manure are to be noted. There was a wide difference in yields of all of the crops, as shown in Table IV, which gives the maximum, minimum, and average yields of each crop in 1919, as well as the average yield of each crop for the years 1913 to 1918, inclusive. The table indicates that alfalfa gave higher yields when seeded in the fall in grain stubble than when seeded the following spring and that the highest yield occurred the second year after planting.

TABLE IV.—*Average, maximum, and minimum yields of all crops in the irrigated rotations on the Huntley Experiment Farm in 1919, compared with the average yields of the same crops in the 6-year period from 1913 to 1919, inclusive.*

Crop and variety.	Number of plats.	Unit of yield.	Yield per acre.								
			1919			1918	1917	1916	1915	1914	1913
			Maximum.	Minimum.	Average.						
Alfalfa (Montana):											
Spring seeded.....	5	Ton.....	2.28	0.47	1.25	2.22	2.03	2.07	2.34	2.22	2.20
Fall seeded.....	4	do.....	2.77	2.40	2.63	3.17	3.42				
Second year.....	9	do.....	6.81	4.22	6.09	5.34	5.71	5.26	7.14	5.40	5.85
Third year.....	5	do.....	4.31	4.18	4.24	6.13	5.38	6.26	7.00	5.26	5.35
Continuously cropped..	5	do.....	6.83	4.61	5.77	5.45	4.65	4.98	4.72	4.62	4.51
Sugar beets (Kleinwanzlebener).	19	do.....	15.86	5.75	10.15	12.23	9.82	11.17	9.58	11.16	13.06
Potatoes (Mills Prize).....	17	Bushel....	389.0	98.1	249.3	367.6	218.2	240.3	301.8	167.8	212.7
Oats (Swedish Select).....	21	do.....	83.1	22.5	52.7	90.7	75.0	78.2	79.3	89.8	84.2
Wheat (Pringle Champlain)	5	do.....	27.3	27.3	27.3	23.9	26.5	26.5	32.3	32.7	27.2
Corn (Northwestern Dent)...	8	do.....	60.0	22.2	42.7	45.9	32.6	36.3	36.9	42.9	42.0
Flax (Minnesota No. 25)....	2	do.....	15.6	1.4	8.5	20.2	18.9	17.7	21.3	18.6	21.7

The yields in 1919 of oats, potatoes, and sugar beets in each rotation and the preceding crop are shown in Table V.

The maximum yields of potatoes occurred in rotation 25, which is a 2-year rotation of oats and potatoes in which manure is applied preceding the potatoes. The average yield of two plats of potatoes following oats and manure was 310.6 bushels per acre, while the average yield of two plats of potatoes following oats without manure was at the rate of 249.3 bushels per acre. Five plats following

alfalfa yielded at the average rate of 296.9 bushels per acre. The yield of continuously cropped potatoes was about the same as the yield of potatoes following sugar beets and was less than when preceded by alfalfa, oats manured, or oats without manure. In a 2-year rotation of sugar beets and potatoes in which manure was applied immediately preceding the potatoes the yield was much higher than when potatoes followed beets without manure.

The maximum yield of sugar beets occurred in the rotations in which beets followed potatoes, the average of six plats being at the rate of 11.17 tons per acre. The average yield of sugar beets in three rotations in which beets followed oats and manure was at the rate of 11.08 tons per acre, while in five rotations in which beets followed oats without manure the yield was at the rate of 9.20 tons per acre.

TABLE V.—Yields per acre of oats, potatoes, and sugar beets with the preceding crops in the irrigated rotations on the Huntley Experiment Farm in 1919.

Oats.			Potatoes.			Sugar beets.		
Preceding crop.	Rotation No.	Yield.	Preceding crop.	Rotation No.	Yield.	Preceding crop.	Rotation No.	Yield.
		<i>Bushels.</i>			<i>Bushels.</i>			<i>Tons.</i>
Beets.....	35	83.1	Oats (manured)...	25	389.0	Potatoes.....	34	15.86
Do.....	64	76.2	Alfalfa.....	60	379.7	Oats (manured)...	61	13.66
Corn (hogged)...	69	73.7	do.....	61	354.7	Potatoes.....	35	13.33
Potatoes.....	60	71.3	do.....	64	301.0	Beets.....	2a	12.92
Beets.....	34	68.7	Beets.....	20	282.3	Potatoes.....	21	12.48
Potatoes.....	61	64.4	Oats.....	34	258.0	Oats.....	60	12.02
Beets.....	22	63.7	Beets (manured)...	21	246.6	Flax.....	67	12.00
Do.....	46	60.0	Alfalfa.....	40	246.0	Oats (manured)...	23	11.90
Oats.....	1a	57.5	Oats.....	24	240.6	Potatoes.....	64	10.39
Alfalfa.....	42	57.5	Oats (manured)...	35	232.3	Alfalfa.....	46	9.41
Potatoes.....	44	54.4	Corn.....	26	221.6	Oats.....	32	9.33
Do.....	25	54.4	Potatoes.....	4	204.1	do.....	22	9.28
Corn.....	16	50.0	Alfalfa.....	44	203.1	Potatoes.....	20	8.58
Beets.....	23	48.1	Potatoes.....	4a	193.3	Oats.....	30	7.72
Potatoes.....	24	41.9	Oats (rye).....	27	170.0	Oats (manured)...	31	7.70
Do.....	31	30.6	Beets.....	30	167.3	Oats.....	42	7.66
Do.....	30	26.9	do.....	31	148.0	Wheat.....	18	6.47
Corn.....	32	26.9				Potatoes.....	40	6.40
Potatoes.....	27	23.1				Beets.....	2	5.75
Oats.....	1	21.9						
Average.....		52.7	Average.....		249.3	Average.....		10.15

SILAGE CROPS.

CORN.

Two varieties of corn, Northwestern Dent and a local Yellow Dent, both early maturing, were grown for silage on 17 quarter-acre plats in fields O-II and O-III. These varieties were selected as being the ones most commonly grown locally. Both varieties were fairly well matured at the time of harvest, September 6, and made silage of excellent quality. The average yield of nine plats of Northwestern Dent corn was at the rate of 9.74 tons per acre

and of local Yellow Dent 8.56 tons per acre. In tests conducted in previous seasons the variety Northwestern Dent has invariably outyielded other varieties of early-maturing corn that have been grown.

Northwestern Dent corn for silage was also grown on 11 quarter-acre plats in field L-II, where the yield was at the rate of 10.39 tons per acre (fig. 1).

SUNFLOWERS.

A test of cultural methods with sunflowers grown for silage which was conducted in 1918 was continued in 1919 with some modifications. Sunflowers of the Mammoth Black Russian variety were grown in rows 20, 30, and 40 inches apart. They were planted on



FIG. 1.—Northwestern Dent corn grown for silage on the Huntley Experiment Farm in 1919.

May 12 with a corn planter, the seed being drilled, the plants in the row averaging about 6 inches apart. The crop required three irrigations. The crop was harvested on August 25, at which time the plants were from one-fourth to one-half in bloom in the different plats. Experience of the previous season appeared to indicate that if harvested when more nearly matured the crop made a silage which was rather hard and woody, and consequently not palatable to stock. The silage made from the crop grown in 1919 appeared to be of better quality than that grown in 1918 and kept in better condition in the silo, although it was not in perfect condition when removed from the silo and was not readily eaten by cattle when fed in a comparative test of corn and sunflower silage. The yields in the 1919 test are given in Table VI, being the average in each case of four one-fourth acre plats.

TABLE VI.—Yields of sunflowers for silage on the Huntley Experiment Farm in 1919.

Width of row.	Yield.	
	Pounds per plat.	Tons per acre.
<i>Inches.</i>		
20	14,876	29.75
30	13,875	27.75
40	13,626	27.25

Table VI indicates that the highest yield of 29.75 tons per acre occurred on the plats in which the rows were 20 inches apart, and the lowest on the plats on which the rows were 40 inches apart. Similar results were secured in a similar test in 1918. The silage made from the sunflowers grown in the 20-inch rows was also of better quality, being less coarse and woody.

SUGAR BEETS.

ROOT-LOUSE CONTROL.

An experiment to determine the means of preventing damage to sugar beets by invasion of the beet root louse was continued as in previous seasons, this being the sixth year of the experiment. Varying numbers of irrigations, from two to five, were applied, the plats receiving the larger number of irrigations being irrigated the first time somewhat earlier and the last time later than is commonly done in farm practice. The beet root lice migrate to the beet fields during the early part of July and under favorable conditions enter the soil around the beet roots, where they increase rapidly in numbers and do serious damage to the crop unless they are checked. A dry, cracked soil at this time appears to be favorable to their becoming established. It was the purpose of the experiment to determine whether early irrigation and frequent later irrigations to keep the soil in a moist condition at all times would be effective against the spread of the root lice and in preventing serious damage to the beet crop. In ordinary practice an average of three irrigations is applied to beets, and the first is usually not applied until after the migration period of the root lice.

Drought during the early part of the season made it necessary to irrigate to germinate the seed, which was done on June 1, and also to irrigate all of the plats again on June 23, before thinning. Dates of irrigation after the crop was thinned were as follows: Five irrigations—July 11, 20, and 30 and August 12 and 25; four irrigations—July 11 and 20 and August 5 and 20; three irrigations—July 18 and August 5 and 20; two irrigations—July 25 and August 20.

The yields, amount of infestation, and sugar content of the beets are shown in Table VII.

TABLE VII.—*Yield, sugar content, and percentage of infestation of sugar beets in the root-lice control experiments on the Huntley Experiment Farm in 1919.*

Plat No.	Number of irrigations.	Tons per acre.	Sugar content (per cent).	Infestation (percent).		Stand (plants per acre).
				Total.	Injurious.	
L-II-9a.....	5	13.65	16.3	20.19	2.41	16,758
L-II-9b.....	4	12.74	16.3	23.42	2.0	17,100
L-II-10a.....	3	13.33	15.7	43.24	7.46	17,127
L-II-10b.....	2	12.61	16.4	50.82	10.38	16,893
L-II-11a.....	5	9.46	14.7	11.71	.80	12,060
L-II-11b.....	4	12.52	14.6	27.23	3.48	14,472
L-II-12a.....	3	12.27	16.0	48.08	13.31	16,695
L-II-12b.....	2	13.31	15.2	51.78	12.94	17,658
L-II-13a.....	5	14.80	15.6	10.02	.31	17,325
L-II-13b.....	4	13.45	15.0	20.49	2.12	15,678
L-II-14a.....	3	13.46	12.7	27.89	5.76	15,777
L-II-14b.....	2	11.49	14.5	43.92	9.19	13,995
L-II-15a.....	5	8.59	17.4	8.66	.60	13,293
L-II-15b.....	4	8.87	16.3	10.08	.73	12,222
L-II-16a.....	3	10.96	14.3	10.69	1.52	13,041
L-II-16b.....	2	13.91	14.5	24.12	3.58	15,300
Average.....	5	11.62	16.0	12.64	1.03	-----
Do.....	4	11.89	15.5	20.30	2.08	-----
Do.....	3	12.51	14.7	32.47	7.01	-----
Do.....	2	12.83	15.1	42.66	9.02	-----

The results indicate that the percentage of infestation increased consistently as the number of irrigations was decreased. It is also noted that there appeared to be a decrease in the sugar content in the beets where the percentage of infestation was higher. While the average yield from the plats that received five irrigations was less than on the plats that were irrigated two and three times, it will be noted that poor stands occurred on some of the plats receiving the higher number of irrigations and that if the plats of poor stands are eliminated in considering the results the plats that received five irrigations were highest in yield, while the lowest yield occurred on the plats that received two irrigations. The results in these experiments in previous years appear to indicate that less infestation by the root lice occurs when five irrigations are applied, that the yields are increased, and that the beets that are free from lice invariably contain a larger percentage of sugar.

FRUIT TREES.

Tests of about 50 varieties of apples indicate that only the hardiest varieties will withstand the severe winter conditions and that these hardy varieties make but very slow growth and do not bear fruit for a number of years after planting. In 1919 the Northwestern (*Northwestern Greening*), Patten (*Patten's Greening*), and Wealthy varieties, trees of which were planted in 1911 and 1912, yielded from 10 to 60 pounds per tree, this being the first fruit produced by these trees.

All of the varieties of crab apples that have been tried have proved to be hardy and have borne fruit in four to five years after planting. The varieties that have produced the largest quantity of fruit are the Lyman (*Lyman's Prolific*), Excelsior, and Florence. Trees of these varieties that were planted in 1911 and 1912 yielded from 30 to 50 pounds of fruit each in 1919.

FEEDING EXPERIMENTS WITH HOGS.

The swine-feeding experiments conducted during the season of 1919 were planned to carry on the work outlined in 1917 and 1918, with the addition of a more thorough investigation of the feeding value of barley. This work was conducted in cooperation with the Animal Husbandry Division of the Bureau of Animal Industry.

The pigs used were, with one exception, pure-bred Duroc-Jerseys, all sired by the same boar. One spring pig in the pasturing experiment was a high-grade Duroc-Jersey. The pasture plats were in field A-III, which was seeded in 1916 and used as a hog pasture in 1917 and 1918.

FATTENING FALL PIGS IN A DRY LOT AND ON ALFALFA PASTURE¹

On July 7, 50 fall pigs, previously on irrigated rotations and dry-land pastures, were divided into six lots and fed barley or corn supplemented with different protein feeds to determine the fattening qualities of the several rations. The experiment extended over a period of four weeks.

Lots 1 to 4 contained three barrows and three gilts each, their average weight¹ being 168 pounds. These hogs were fed in a dry lot on the following rations: Lot 1, barley and skim milk; lot 2, corn and skim milk; lot 3, barley and tankage in the proportion of 10 pounds to 1 pound; lot 4, barley alone.

Lot 5, with seven barrows and six gilts, and lot 6, with six barrows and seven gilts, averaged about 133 pounds per pig. Each lot had access to alfalfa pasture, consuming the equivalent of the second cutting of hay from one-eighth of an acre. Lot 5 received a grain ration of ground barley, and lot 6 received ground barley and tankage fed in the proportion of 10 to 1.

The grain ration was hand fed twice a day, being all that the hogs would eat in 30 minutes. The results are shown in Table VIII.

A comparison of lots 1 and 2 indicates the relative values of corn and barley when supplemented with skim milk. For each pound of gain made the hogs consumed 3.32 pounds of corn and 3.53 pounds of barley. Thus 94 pounds of corn were equal to 100 pounds of barley in this test.

¹ This report was prepared by Ralph E. Gongwer, who had charge of the animal-husbandry work of the station, being detailed for this work by the Animal Husbandry Division of the Bureau of Animal Industry.

TABLE VIII.—*Results of experiment in finishing fall pigs on various rations supplementary to alfalfa pasture on the Huntley Experiment Farm in 1919.*

Items of comparison.	Lot 1, barley, skim milk.	Lot 2, corn, skim milk.	Lot 3, barley, 10 pounds; tankage, 1 pound.	Lot 4, barley.	Lot 5, barley, alfalfa pasture.	Lot 6, barley, 10 pounds; tankage, 1 pound; alfalfa pasture.
Duration of experiment.....days..	28	28	28	28	28	28
Number of pigs in lot.....	6	6	6	6	13	13
Daily feed, consumption:						
Grain, per hundredweight...pounds..	3.26	2.89	3.6	3.5	3.64	3.72
Milk.....do.....	5.75	5.62				
Average weight:						
Initial.....do.....	167.3	169.8	166.8	167.2	134.2	132.3
Final.....do.....	216.2	216.8	209.8	207.5	166.7	163.5
Daily gain.....do.....	1.74	1.68	1.54	1.44	1.16	1.13
Total feed consumed:						
Grain.....do.....	1,034	935	1,115	1,080	1,964	1,964
Skim milk.....do.....	1,821	1,821				
Feed consumed per pound of gain:						
Grain.....do.....	3.53	3.32	4.32	4.46	4.65	4.84
Skim milk.....do.....	6.22	6.46				

Lots 1, 3, and 4 show the value of barley supplemented with skim milk, compared to barley with a tankage supplement and barley fed alone. Barley and skim milk produced the most rapid gains, but barley and tankage proved to be the most economical ration when the value of the skim milk consumed in lot 1 is considered. A ration of barley alone made the slowest gains and required the most grain per unit of gain.

Lots 5 and 6 are not comparable to the first four lots, as the pigs were smaller and were somewhat stunted, due to running on dry-land pastures just previous to the experiment. Lots 5 and 6 gained at about the same rate, but the barley and tankage lot required 18 pounds more feed to produce 100 pounds of pork. The addition of tankage to the ration also increased the cost of the feed in lot 6 over that in lot 5 on barley alone.

Barley and tankage fed in the proportion of 10 pounds to 1 pound produced the cheapest gains of any ration fed and were only slightly below the barley or corn plus the skim-milk ration with respect to rapidity of gains. Tankage was unnecessary in a ration of barley when the pigs had access to good alfalfa pasture.

FATTENING FALL PIGS ON ALFALFA PASTURE.

Two lots of 11 hogs each were placed on two quarter-acre plats of alfalfa on May 15, and remained for a period of 35 days. Lot 1 received a full feed of ground barley and lot 2 a full feed of shelled corn, in order to test the relative merits of the two feeds for fattening purposes. The results obtained are noted in Table IX.

The gains besides being more rapid in the corn-fed lot were also made with less grain and hay, 77 pounds of corn producing as much

pork as 100 pounds of barley with 21 per cent less hay. These results indicate that for a short, quick finish on alfalfa pasture, corn produces pork more rapidly and economically than barley.

TABLE IX.—*Comparison of barley and corn for fattening fall pigs on alfalfa pasture on the Huntley Experiment Farm in 1919.*

Items of comparison.	Lot 1, barley.	Lot 2, corn.
Initial weight:		
Total, on May 15.....pounds..	1,449	1,450
Average per pig on May 15.....do....	131.7	131.8
Final weight:		
Total, on June 19.....do....	1,933	2,063
Average per pig on June 19.....do....	175.7	187.5
Total gain.....do....	484	613
Average daily gain, 35 days.....do....	1.26	1.59
Feed consumed:		
Total grain.....do....	2,219.5	2,153.2
Daily grain per hundredweight of body.....do....	3.71	3.46
Feed consumed per pound of gain:		
Grain.....do....	4.59	3.51
Hay equivalent.....do....	.62	.49

COMPARISON OF BARLEY AND CORN FOR BROOD SOWS WITH SUCKLING PIGS.

On April 1, 11 pure-bred Duroc-Jersey sows with pigs of an average age of 2 weeks were divided into two lots as nearly equal in total weight and number of pigs per lot as was possible. Both lots were fed equal quantities of skim milk, and each sow received 2 pounds of mill feed and one-quarter pound of tankage per day. Lot 1 received in addition a grain ration of ground barley in comparison with lot 2 receiving a grain ration of corn. Sufficient grain was fed to keep the sows from losing too much flesh. The experiment covered a period of five weeks.

On May 14, four sows were divided into two lots as nearly equal in total weight as was possible when leaving an equal number of pigs in each lot. These two lots, 3 and 4, were grazed on two quarter-acre plats of alfalfa, the crop being nearly 12 inches high when the sows and pigs were turned on. Lot 3 received a 2 per cent ration of barley and lot 4 a 2 per cent ration of corn to supplement the pasture. The experiment extended from May 14 to June 11. The results obtained in these two tests are combined in Table X.

Comparing lots 1 and 2, the results show that a heavier ration was required to maintain weight in the sows fed with corn than in those fed with barley, a 1.92 per cent ration of barley equaling a 2.18 per cent ration of corn. Although the pigs running with the sows that were fed corn gained more rapidly, more grain was required to produce a pound of this gain.

In lots 3 and 4 a 2 per cent grain ration failed to prevent severe loss in weight of the sows while on pasture, and the daily loss for the corn-fed sows was almost twice as great as for the barley-fed lot. In this case the pigs in lot 3 fed on barley gained more rapidly than

those in lot 4, or 0.62 pound per day per head compared to 0.38 pound per day per head. The loss in weight of the two sows on alfalfa pasture plus a 2 per cent ration of corn was so great that it outweighed the gain in weight of the pigs, showing a net loss of 9 pounds. The 2 per cent ration seemed to be inadequate for their needs. In lot 3 on the barley ration the sows maintained their weight better, the pigs gained more rapidly, and less grain was required per unit of gain.

TABLE X.—*Comparison of barley and corn when fed in a dry lot and on the alfalfa pasture for brood sows with suckling pigs on the Huntley Experiment Farm in 1919.*

Items of comparison.	Lot 1, barley.	Lot 2, corn.	Lot 3, barley.	Lot 4, corn.
Dry-lot period.....days.....	35	35		
Pasture period.....do.....			28	28
Number of sows.....	5	6	2	2
Number of pigs.....	38	41	15	15
Total initial weight:				
Sows.....pounds.....	1,871	2,057	678	734
Pigs.....do.....	318	380	264	152
Total final weight:				
Sows.....do.....	1,780	1,959	592	565
Pigs.....do.....	899	1,088	496	312
Average daily weight:				
Loss per sow.....do.....	.52	.46	1.53	3.02
Gain per pig.....do.....	.44	.49	.62	.38
Total weight, sows and pigs:				
Initial.....do.....	2,189	2,437	942	886
Final.....do.....	2,679	3,047	1,088	877
Gain.....do.....	490	610	146	9
Feed consumed:				
Skim milk.....do.....	2,450	2,450		
Mill feed.....do.....	350	420		
Tankage.....do.....	43.75	52.5		
Alfalfa pasture (hay equivalent).....do.....			600	600
Grain.....do.....	1,642.5	2,096	372	387
Grain per hundredweight, sows.....do.....	1.92	2.18	2.02	2.00
Grain consumed per pound of gain:				
Sows and pigs.....do.....	3.35	3.44	2.55	(¹)
Pigs alone.....do.....	2.81	2.96	1.60	2.42

¹ No gain.

The results are corroborated by a test conducted at this station in 1917. In two lots of two sows each, one lot fed corn and the other fed barley and both grazing on alfalfa pasture, a pound of gain was produced in the pigs with 2.18 pounds of barley while 2.5 pounds of corn were required.

Considering these facts, it was found that for a brood sow with suckling pigs, whether in a dry lot or on alfalfa pasture, a barley ration seemed to maintain a more uniform weight in the sows and produce cheaper gains on the pigs than corn.

VARYING GRAIN RATIOS FOR SPRING PIGS ON ALFALFA PASTURE.

Eight lots of eight pigs each, as nearly uniform in age, weight, and breeding as possible to select, were placed on alfalfa pasture on June 17 for a period of 99 days. Lots 1, 2, and 3 received corn at the rate of 1 per cent, 2 per cent, and 3 per cent, respectively, of the body weight per day; lot 4 received corn from a self-feeder; lots 5, 6,

and 8 received ground barley at the rate of 1 per cent, 2 per cent, and 3 per cent, respectively, of the body weight per day; and lot 7 received no grain. All lots were on divided pasture with the exception of lot 5, and all lots grazed quarter-acre areas except lot 7, which grazed half an acre. The results are noted in Table XI.

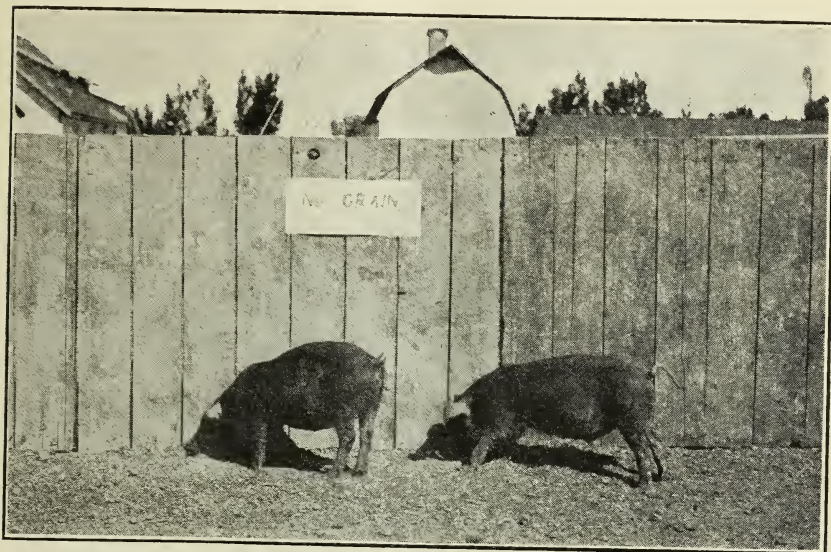


FIG. 2.—“No grain” spring pigs at the end of the pasture season, average weight 63.6 pounds, on the Huntley Experiment Farm in 1919.

TABLE XI.—Feeding varying grain rations to spring pigs in lots of eight each on alfalfa pasture on the Huntley Experiment Farm in 1919.

[Area of pasture for lot 7 one-half acre, for all other lots one-fourth acre each.]

Items of comparison.	Lot 1, 1 per cent corn.	Lot 2, 2 per cent corn.	Lot 3, 3 per cent corn.	Lot 4, self-fed corn.	Lot 5, 1 per cent barley.	Lot 6, 2 per cent barley.	Lot 7, no grain.	Lot 8, 3 per cent barley.
Average weight, per pig:								
Initial, June 17.....	40.1	40.5	40.2	40.1	41.0	40.8	40.5	40.6
Final, September 24.....	63.6	71.5	108.8	139.2	60.0	71.9	53.1	90.0
Daily gain.....	.236	.313	.693	1.001	.192	.314	.128	.499
Pork produced per acre.....	748	992	2,196	3,172	608	996	202	1,580
Feed consumed per pound of gain:								
Grain.....	2.18	3.54	3.00	3.23	2.63	3.41	.....	3.66
Hay equivalent ¹	4.33	3.27	1.48	1.02	5.33	3.25	16.00	2.05

¹ The yield of hay was estimated from two check plats yielding at the rate of 3,240 pounds of hay per acre in the last two cuttings.

Table XI shows that the rate of gain increases with the amount of grain fed. Lot 7, receiving no grain, made an average daily gain of 0.128 pound per pig, while the grain-fed lots increased in daily gain as the grain ration increased up to 1 pound per day in the self-fed lot. (See figs. 2 and 3.)

The grain required per pound of gain was highest in the 3 per cent barley lot. In the lots fed barley the least grain was required to

produce a pound of pork in the 1 per cent lot, followed in turn by the 2 per cent and the 3 per cent lots. In the lots fed corn, the 2 per cent lot made poor gains and hence required the largest weight of corn per pound of gain. Aside from this lot, the corn-fed lots arranged themselves, as did the barley-fed lots, with respect to grain consumed per pound of pork produced, the self-fed lot requiring the most grain and the 1 per cent lot the least grain.

The amount of pasture consumed per pound of gain, reduced to a hay basis, decreased with each increase in the grain fed. This was true both in the barley and in the corn fed lots. This experiment

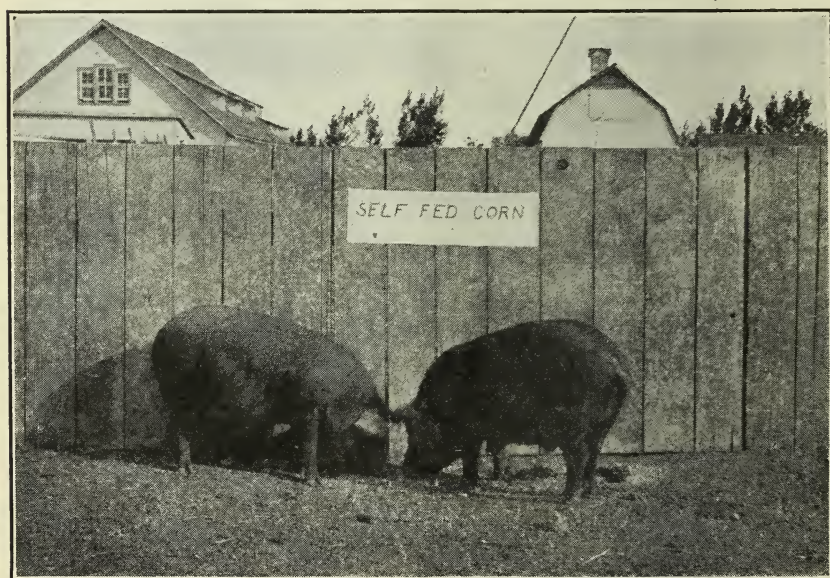


FIG. 3.—Spring pigs on alfalfa pasture and self-fed corn at the end of the pasture season, average weight 139.2 pounds, on the Huntley Experiment Farm in 1919.

also affords a comparison of the value of corn and barley as supplements to alfalfa pasture between lots 1, 2, and 3, fed corn, and lots 5, 6, and 8, fed barley. The average of these three comparisons shows that 90 pounds of corn are equal to 100 pounds of barley.

DRY-LOT PERIOD.

An accurate conception of the relative values of these various grain rations on alfalfa pasture is obtained after the pigs have reached a marketable weight. This necessitates a dry-lot finishing period for all lots.

Six representative pigs were selected from each lot and placed in a dry lot on September 25. Each lot was fed all the alfalfa hay that the pigs would consume, also ground barley and tankage in a self-feeder, mixed in the proportion of 10 pounds of barley to 1 pound of tankage. The results are noted in Table XII.

TABLE XII.—*Dry-lot period spring pigs in lots of six each fed on a varying grain ration on the Huntley Experiment Farm after the pasture season of 1919.*

Items of comparison.	Lot 1, 1 per cent corn.	Lot 2, 2 per cent corn. ¹	Lot 3, 3 per cent corn.	Lot 4, self-fed corn.	Lot 5, 1 per cent barley.	Lot 6, 2 per cent barley.	Lot 7, no grain.	Lot 8, 3 per cent barley.
Dry-lot period.....days..	85	73	62	41	78	76	105	56
Average weight per pig:								
Initial, September 25, pounds.....	68.7	78.2	103.7	133.0	65.8	70	56.7	98.5
Final.....pounds.....	181.7	186.6	196.2	198.5	182.7	174.0	200.0	193.3
Daily gain.....do.....	1.33	1.48	1.49	1.60	1.50	1.37	1.36	1.69
Total feed consumed:								
Grain.....do.....	3,506	2,764	2,780	1,926	3,763	3,315	4,581	2,912
Hay.....do.....	55	33	30	10	57	54	27	59
Grain fed per pound of gain.....do.....	5.17	5.10	5.01	4.90	5.37	5.31	5.33	5.12

¹ One pig developed hernia and was removed from the lot. Correction has been made for the grain consumed.

During the dry-lot period there was very little choice between the eight lots in the rate of gain and in the feed consumed per unit of gain. The most rapid gains were made in lot 8, 1.69 pounds per pig per day, and the lowest gains were in lot 1, 1.33 pounds per pig per day. The grain required per pound of gain was highest in lot 5, 5.37 pounds, and the lowest in lot 4, 4.90 pounds. All lots made reasonable gains and none of the pigs appeared to be stunted or unthrifty due to their limited grain ration during the pasture season. The results from the pasture and dry-lot periods are combined in Table XIII.

TABLE XIII.—*Spring pigs, in lots of eight each, on alfalfa pasture with varying grain rations and in a dry lot on the Huntley Experiment Farm in 1919.*

[Area of pasture for lot 7, one-half acre, for all other lots one-fourth acre each.]

Items of comparison.	Lot 1, 1 per cent corn.	Lot 2, 2 per cent corn.	Lot 3, 3 per cent corn.	Lot 4, self-fed corn.	Lot 5, 1 per cent barley.	Lot 6, 2 per cent barley.	Lot 7, no grain.	Lot 8, 3 per cent barley.
Pasture period.....days..	99	99	99	99	99	99	99	99
Dry-lot period.....do.....	85	73	62	41	78	76	105	56
Total.....	184	172	161	140	177	175	204	155
Weight per pig:								
Initial.....pounds..	40.1	40.5	40.2	40.1	40.0	40.8	40.5	40.6
At end of pasture season.....pounds..	63.6	71.5	108.8	139.2	60.9	71.9	53.1	90.0
At beginning of dry-lot season.....pounds..	68.7	78.2	103.7	133.0	65.8	70.0	56.7	98.5
Final.....do.....	181.7	186.6	196.2	198.5	182.7	174.0	200.0	193.3
Daily gain.....do.....	.74	.86	1.00	1.18	.77	.77	.76	.93
Total feed consumed:								
Grain.....do.....	5,083	5,300	5,349	5,130	5,417	5,264	6,108	5,329
Hay and hay equivalent.....pounds..	883	863	850	823	886	882	1,656	889
Feed consumed per pound of gain:								
Grain.....pounds..	4.66	4.75	4.15	3.90	4.98	4.87	4.89	4.62
Hay.....do.....	.81	.77	.66	.62	.81	.82	1.33	.77

The average grain consumption per pound of gain for all lots on pasture, exclusive of lot 7, was 3.18 pounds. For the dry-lot period the same figure for all lots was 5.19 pounds. The chief advantage then would seem to be in making as much growth as possible on

pasture and reducing the length of the expensive dry-lot period. This is shown in Table XIII. Lot 4, in a dry lot only 41 days, produced a pound of pork with 3.90 pounds of grain during the combined periods. Lot 7, in a dry lot 105 days, required 4.89 pounds of grain to make 1 pound of pork for the two periods even when credited with 101 pounds of pork produced on pasture with no grain charge.

Lot 4, self-fed corn, required the least grain and the least hay and pasture to produce a pound of pork. The 3 per cent corn and the 3 per cent barley lots followed in the order named in economy of gains.

A comparison of the corn-fed and the barley-fed lots would be of more value if the difference in feeds had been continued during the dry-lot period. Lots 1, 2, 3, and 4 received barley after the first 56 days of the experiment. Comparing lots 1, 2, and 3 with lots 5, 6, and 8 in Table XIII, the corn-fed pigs made a pound of pork with 0.3 pound less grain and 0.05 pound less hay.

AVERAGE RESULTS, 1917, 1918, AND 1919.

The results obtained in this experiment over a period of three years, with corn as the varying grain ration, on alfalfa pasture, are compiled in Table XIV. The conditions each year were similar to those described for 1919.

TABLE XIV.—*Results of feeding spring pigs on alfalfa pasture and in a dry lot on the Huntley Experiment Farm averaged for 1917, 1918, and 1919.*

Items of comparison.	No grain.	1 per cent corn.	2 per cent corn.	3 per cent corn.	Self-fed corn.
Area of pasture.....acres.	0.50	0.25	0.25	0.25	0.25
Number of pigs.....	8	7½	8	8½	8½
Pasture period.....days.	85	85	85	85	85
Dry-lot period.....do.	132	121	105	84	70
Total.....do.	217	206	190	169	155
Weight per pig:					
Initial.....pounds.	38	37	38	38	38
At end of pasture season.....do.	48	55	67	90	122
At beginning of dry-lot season.....do.	50	57	68	89	120
Final.....do.	187	182	193	201	203
Gain per pig:					
Total.....do.	147	143	154	164	167
Daily.....do.	.68	.70	.81	.97	1.08
Total feed consumed:					
Grain.....do.	5,615	5,022	5,698	5,915	5,561
Hay or hay equivalent.....do.	2,878	1,445	1,209	1,466	1,498
Feed consumed per pound of gain:					
Grain.....do.	4.75	4.78	4.63	4.16	4.00
Hay.....do.	2.44	1.37	1.07	1.03	1.08

Table XIV shows that the average daily gain per pig in the lots receiving no grain, 1 per cent corn, 2 per cent corn, 3 per cent corn, and self-fed corn was 0.68 pound, 0.70 pound, 0.81 pound, 0.97 pound, and 1.08 pounds, respectively, for the combined pasture and dry-lot periods. The weights of grain required per pound of gain for the

same periods and lots were 4.75, 4.78, 4.63, 4.16, and 4.00 pounds, respectively. The weights of hay and hay equivalent required per pound of gain for the same periods and the same lots were 2.44, 1.37, 1.07, 1.03, and 1.08 pounds, respectively.

With these figures, the result of experimentation for three years with 121 hogs as a basis, it may be said:

(1) That the heavier the grain ration fed to spring pigs grazing on alfalfa pasture the more quickly they reach a marketable weight.

(2) That the hay and pasture required per pound of gain decreased with an increase in the grain ration on pasture, with the exception of a slight increase in the self-fed lot over the 2 and 3 per cent lots.

(3) That aside from the fact that the pigs fed no grain required 0.03 pound less grain for the entire period than those fed with a 1 per cent ration to produce a pound of pork, the larger the amount of grain fed while on pasture the less grain was required to grow a hog to a marketable weight.

CROP-UTILIZATION EXPERIMENTS.

PASTURING ALFALFA WITH HOGS.

In rotation 67, field K, and in rotation 69, field L-IV, two quarter-acre plats of third-year alfalfa are pastured by hogs. The pasturing season is divided into two periods: May to June, inclusive, the spring period, and July to October, the summer period. Fall pigs are used during the first period and spring pigs during the second. The pigs are put on at the rate of 2,000 to 2,500 pounds per acre.

Each plat is divided into two equal areas and the hogs alternated from one pasture to the other each 9 to 12 days, depending upon the growth of the alfalfa. This arrangement allows the hogs fresh pasture at regular intervals and makes irrigation more convenient. The hogs are weighed each 14 days. With these weights as a basis the hogs are fed a supplementary ration of shelled corn at the rate of 2 pounds daily per 100 pounds live weight.

The results obtained from pasturing alfalfa with hogs for the years 1913 to 1919, inclusive, are shown in Table XV.

TABLE XV.—Results of pasturing pigs on alfalfa on the Huntley Experiment Farm during the 7-year period from 1913 to 1919, inclusive.

[Calculations reduced to an acre basis. As only the third crop of alfalfa was pastured in 1913, the results for that year are not used in determining the averages.]

Year.	Rotation No.	Number of pigs.		Number of days.	Pigs (weight in pounds).				Grain fed per pound of gain.
		Spring.	Summer.		Initial.	Final.	Gain.		
							Total.	Average daily per pig.	
1913.	67	.....	48	41	2,788	3,624	836	0.50	2.65
1914.	67	16	36	138	3,272	5,572	2,300	.42	2.78
1915.	67	20	32	150	4,364	6,840	2,476	.70	3.13
1916.	67	20	32	145	3,520	6,552	3,032	.85	2.79
1917.	67	16	36	150	3,280	5,460	2,180	.74	2.87
1917.	69	20	32	152	3,288	5,768	2,480	.72	2.64
1918.	67	20	32	148	3,200	5,560	2,360	.66	2.72
1918.	69	20	32	148	3,216	5,464	2,248	.63	2.85
1919.	67	20	32	159	3,720	6,196	2,476	.57	2.99
1919.	69	20	32	161	3,700	5,796	2,096	.48	3.43
Average.		19	33	150	3,057	6,912	2,405	.64	2.91

HOGGING-OFF CORN.

The spring pigs used to pasture the alfalfa in rotation 67, field K, are used to hog-off the corn in the same rotation in the fall. The hogs are put on the plats of mature corn at the rate of 1,000 to 1,500 pounds per acre.

Table XVI gives the results obtained from hogging-off corn for the eight years 1912 to 1919, inclusive, reported on an acre basis.

TABLE XVI.—*Results of hogging-off corn on the Huntley Experiment Farm during the 8-year period from 1912 to 1919, inclusive.*

[Calculations reduced to an acre basis.]

Year.	Number of hogs.	Number of days.	Weight (pounds).					Estimated yield.
			Hogs.			Pork per acre per day.	Grain fed per pound of gain.	
			Initial.	Final.	Total gain.			
1912.....	20	16	2,900	3,288	388	24.2	5.3	<i>Bushels.</i> 36.4
1913.....	16	23	1,312	2,280	768	33.3	4.4	60.0
1914.....	16	22	1,380	2,276	896	40.7	3.2	50.4
1915.....	16	25	1,376	2,240	864	32.6	4.5	52.4
1916.....	16	20	1,516	2,188	672	33.6	5.0	60.0
1917.....	16	24	1,200	1,828	628	25.2	3.8	43.2
1918.....	16	27	1,428	2,152	724	26.8	5.1	65.0
1919.....	16	27	1,636	2,112	476	24.1	4.1	55.0
Average.....	16.5	23	1,594	2,293	677	30.1	4.4	52.8

HOGGING-OFF CORN AND RAPE.

In rotation 69, field L-IV, Dwarf Essex rape is drilled between the corn rows about the last of July at the rate of 8 pounds per acre. By the time the corn matured the rape had made a good growth. The hogs were removed from the alfalfa pasture in the same rotation and put on the corn and rape plats. Table XVII presents the results obtained from pasturing corn and rape during the 4-year period from 1916 to 1919.

TABLE XVII.—*Results of hogging-off corn and rape on the Huntley Experiment Farm for the 4-year period from 1916 to 1919, inclusive.*

[Calculations reduced to an acre basis.]

Year.	Number of hogs.	Number of days.	Weight (pounds).					Estimated yield.
			Hogs.			Pork per acre per day.	Grain fed per pound of gain.	
			Initial.	Final.	Total gain.			
1916.....	8	38	660	1,246	586	15.42	4.85	<i>Bushels.</i> 50.8
1917.....	16	22	1,168	1,700	532	24.18	4.33	41.1
1918.....	16	35	1,156	1,964	808	23.10	3.80	55.0
1919.....	16	29	1,116	1,930	814	48.06	2.41	60.0
Average.....	14	31	1,025	1,716	685	27.69	3.85	51.7

Comparing the average results for eight years of hogging-off corn without rape with the average of four years of hogging-off corn and rape, there seems to be a slight advantage in favor of the corn and rape. This is shown in Table XVIII.

TABLE XVIII.—*Comparison of results of hogging-off corn for four years with rape and for eight years without rape on the Huntley Experiment Farm.*

[Calculations reduced to an acre basis.]

Item of comparison.	Average results.	
	Eight years without rape.	Four years with rape.
Number of hogs per acre.....		
Duration of experiment.....days..	16.5	14
Total weight:	23	31
Initial.....pounds..	1,594	1,025
Final.....do..	2,293	1,710
Gain.....do..	677	685
Pork per acre per day.....do..	30.1	27.7
Yield of corn (estimated).....bushels..	52.8	51.7
Estimated grain fed per pound of gain.....pounds..	4.4	3.85

HOGGING-OFF CORN WITH AND WITHOUT TANKAGE.

In order to test the value of tankage as a supplementary feed for hogs used in hogging-off corn, two lots of eight pigs each were placed on two 1-acre plats of corn, and one lot was given free access to tankage in a self-feeder. The results are presented in Table XIX.

TABLE XIX.—*Comparison of results in hogging-off corn, with and without tankage, on the Huntley Experiment Farm in 1919.*

Items of comparison.	Lot 1, corn alone.	Lot 2, corn and tankage.
Area of pasture.....acres..	1	1
Number of hogs.....	8	8
Duration of experiment.....days..	52	52
Total weight:		
Initial.....pounds..	587	581
Final.....do..	1,082	1,070
Average daily gain.....do..	1.19	1.17
Yield per acre (estimated).....bushels..	50	50
Tankage consumed.....pounds..		37
Estimated corn fed per pound of gain.....do..	5.66	5.72

The results indicate that the addition of tankage to the ration was of no value in increasing the rate of gain or in reducing the corn consumed per unit of gain.

PASTURING EXPERIMENTS.

PASTURING SHEEP.

A pasture carrying-capacity test with sheep was begun in 1919. The pasture used in this test contained 1.4 acres and was seeded to white clover and bluegrass, one half in 1913 and the other half in 1918 (fig. 4). The pasture was divided and the sheep alternated

from one pasture to the other every 10 to 14 days, as the pasture required. The number of sheep varied during the season, enough sheep being kept to consume all of the pasture. The first ewes and their lambs were placed on pasture on May 11, and the last lambs removed on October 4. During the season of 146 days an average of five ewes and nine lambs were carried per acre of pasture. Calculated to a standard basis, the ewes gained 96 pounds and the lambs 424 pounds from each acre pastured.

PASTURING EXPERIMENTS WITH DAIRY COWS.¹

A pasturing experiment with dairy cattle to determine the carrying capacity of three pasture mixtures which was conducted in 1918

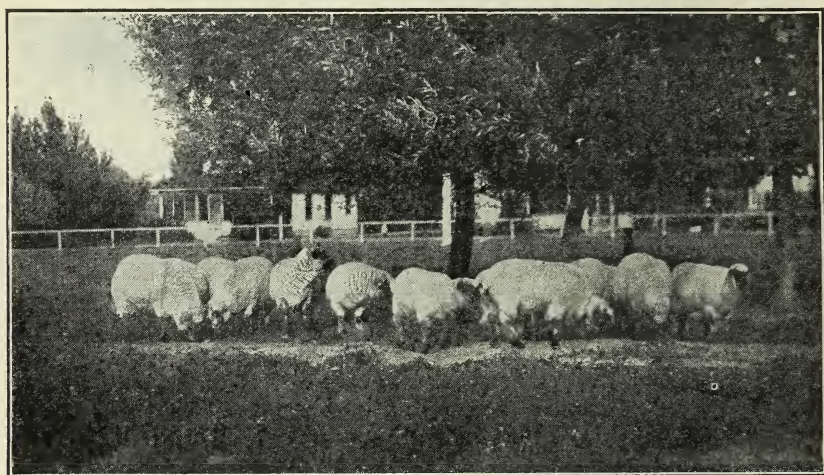


FIG. 4.—Sheep on pasture consisting of bluegrass and white clover on the Huntley Experiment Farm in 1919.

was continued in 1919. The mixtures used in this test and the rate of seeding of each of the grasses and clovers in the mixtures were as shown in Table XX.

TABLE XX.—*Pasture mixtures and rates of seeding in a carrying-capacity test with dairy cattle on the Huntley Experiment Farm in 1919.*

Pasture mixtures.	Rate per acre of seeding (pounds).		
	Mixture No. 1.	Mixture No. 2.	Mixture No. 3.
Awnless brome-grass.....	2	2	5
Orchard grass.....	5	5	3
Tall fescue.....	3	3	4
Perennial rye-grass.....	3	3	2
Kentucky bluegrass.....	4	4	2
White clover.....	2	2	2
Alsike clover.....	2	2	2
Seed per acre.....	21	17	16

¹ This report was prepared by Mr. J. B. Shepherd, who was detailed by the Dairy Division of the Bureau of Animal Industry to have charge of the work with dairy cattle.

These pastures were seeded in 1916 and cut for hay in 1917. There were 2 acres of each pasture mixture, and the pastures in each case were divided.

Since the number of cows in the herd was limited, not enough cows in milk were available for all the pasture experiments, and some of the cows in each lot were dry during the course of the experiment. The cows in milk were divided into as nearly equal lots as was possible with respect to the length of the lactation period, previous and present production, weight, and date of next calving.

In 1918 the cows were not placed on pasture until May 22, and a crop of hay was harvested from the pastures before the pasturing experiment was begun. The pasture period for mixtures Nos. 1 and 3 extended to October 12, or a total of 144 days. The cows on pasture mixture No. 2 were removed on October 2 because of short pasturage, so that the pasture period on this mixture was only 134 days. Three cows were placed on each mixture at the beginning of the test. A fourth cow was added to each group on June 10, as it was found that three cows could not keep the pastures grazed closely enough. They were removed on August 23, only three cows remaining in each group after that date.

Two cows on mixture No. 1 were producing milk during the entire pasture season, but the third cow was dry throughout the season. The fourth cow, which was placed on each mixture from June 10 to August 22, was a dry cow in each case. On mixture No. 2 there were three milking cows, but they were taken from pasture and from the experiment 10 days earlier than were those on mixtures Nos. 1 and 3. On mixture No. 3 two cows were milking part of the season; the third was dry.

In 1919 the cows were placed on pasture on May 8, four cows in each group. One cow was removed from mixtures Nos. 1 and 2 on June 23 and one from mixture No. 3 on June 25. The three cows remaining in each group were carried on the pasture for the remainder of the pasture season with the exception of one week beginning July 9, when they were all removed to allow the pastures to recover from too close grazing. The pasture season extended to September 28, a total of 141 days.

All four cows on each mixture were milking at the beginning of the pasture season. Of the three cows which were on mixture No. 1 during the entire season, two continued to milk until they were taken off pasture, while the third cow went dry on September 10. Two of the three cows on mixture No. 2 were milking throughout the season, while the third cow was dry on August 13. Two cows on mixture No. 3 milked throughout the season, the third going dry on August 13. The cow removed from each mixture the latter part of June was milking during the time she was on the experiment.

The pastures in each part of the experiment were divided and each part pastured alternately for periods of five days to two weeks, de-

pending upon pasturage conditions. Each part of the pasture was irrigated soon after the cows were removed to the alternate pasture until early in September.

Table XXI gives the results per acre obtained from each of the three mixtures in 1918 and 1919.

TABLE XXI.—*Results of pasturing experiments with dairy cows on the Huntley Experiment Farm in 1918 and 1919.*

Items of comparison.	Mixture No. 1.		Mixture No. 2.		Mixture No. 3.	
	1918	1919	1918	1919	1918	1919
Length of grazing season.....days..	144	141	134	141	144	141
Grazing period per acre.....do.....	202	216.5	197.4	216.5	207	217.5
Alfalfa hay fed while cows were off pasture.....pounds..	1,475	536	1,115	513	1,530	542
Average daily number of cows per acre.....	1.402	1.535	1.352	1.535	1.444	1.543
Average gain in weight per cow during season (three cows in each case).pounds..	115	125.6	64	39.2	44	112.3
Milking period per acre.....days..	159.5	227.5	201	213.5	85	214.5
Production per acre:						
Milk.....pounds..	3,016.2	4,527.8	4,041.6	3,789.5	2,587.8	3,993.9
Butterfat.....do.....	105.04	168.05	129.96	137.61	83.95	128.62
Skim milk.....do.....	2,666.3	3,967.4	3,609.1	3,330.8	2,308.3	3,570.2
Hay.....do.....	2,674		2,140		1,278	
Values per acre:						
Butterfat.....	\$44.94	\$90.58	\$53.86	\$74.17	\$36.80	\$69.33
Skim milk.....	13.33	19.83	18.05	16.65	16.65	17.85
Total of butter fat and skim milk....	58.27	110.41	71.91	90.82	48.34	87.18
Hay at \$15 per ton.....	20.05		16.05		9.58	
Total of butter fat, milk, and hay.....	78.32		87.96		57.92	
Hay fed (\$15 per ton in 1918; \$20 per ton in 1919).....	11.06	5.36	8.36	5.15	11.47	5.42
Net returns per acre.....	67.26	105.05	81.60	85.67	46.45	81.76

The number of grazing days denotes the total number of 24-hour days that the cows were pastured on each acre.

The number of milking days denotes the number of 24-hour days that the cows in milk were on the experiment.

The value of the butter fat was computed at the actual average price received in each case, being, in 1918, 42.8 cents per pound for cows on pasture mixture No. 1; 41.44 cents for those on mixture No. 2; and 43.82 cents for those on mixture No. 3. In 1919 the average price received in each case was 53.9 cents per pound. Skim milk was uniformly valued at 50 cents per 100 pounds.

The cows were off pasture during stormy weather, when pastures were short, or on account of injury to a cow, and at night after August 28, 1918, and September 14, 1919. It was during these periods that the hay noted in the above table was fed.

The large net income per acre received from pasture mixture No. 2 in 1918, which was \$81.60 as compared with \$67.26 for mixture No. 1 and \$46.45 for mixture No. 3, was undoubtedly due to the longer period that the cows in milk were on that pasture mixture.

In 1919 the results from the different pasture mixtures were more nearly the same, corresponding closely with the number of milking

days per acre. Since the number of milking days was larger in 1919 and butter fat had a greater value per pound, greater returns resulted in each instance over 1918. While the average number of cows per acre was practically the same on all of the mixtures, it was apparent from observation that the amount and growth of the pasture on mixtures Nos. 1 and 3 were greater than for mixture No. 2, and it was evident that the addition of a small proportion of clover increased the production of the pastures. Mixture No. 1 appeared to have a slight advantage in growth over mixture No. 3, indicating that brome-grass is a valuable addition in a pasture mixture.

CARRYING CAPACITY OF AN ACRE OF IRRIGATED PASTURE.

An experiment to determine the maximum carrying capacity of an acre of mixed-grass pasture was conducted in field A, on 1 acre of pasture seeded to mixture No. 1, already described. This pasture was seeded in 1916 and was top-dressed with manure in 1917 and 1918. The pasture was divided and each part pastured alternately in periods of 5 to 10 days. The pasture season began on May 8 and closed on September 28, a period of 141 days. Two cows were carried on this acre throughout the season with the exception of one week beginning July 9, when they were removed because of too close grazing. Four cows were used on this experiment during the summer. Of the two cows (Nos. 204 and 218) placed on the experiment on May 8, No. 204 was removed on July 23, being replaced by cow No. 216 three days later. Cow No. 218 was removed on September 11, being replaced by cow No. 215 on that date. With the exception of one week beginning July 17, when cow No. 218 was dry, the cows were all giving milk during the time they were on the experiment. Cow No. 204 gained 9 pounds while on the experiment; cow No. 218 gained 40 pounds, and cow No. 216, 31 pounds. Cow No. 215 was on the experiment only 18 days and lost 17 pounds during that period. The carrying capacity proved to be greater than that of the pastures used in the pasture-mixture experiment. Table XXII gives the results obtained in this test.

TABLE XXII.—*Results of the maximum carrying capacity of an irrigated pasture on the Huntley Experiment Farm in 1919.*

Items of comparison.	1919	Items of comparison.	1919
Length of grazing season.....days..	141	Values per acre:	
Grazing period per acre.....do....	255	Butter fat.....	\$100.40
Alfalfa hay fed while cows were off pasture.....pounds..	768	Skim milk.....	26.64
Average daily number of cows per acre.....	1.808	Total of butter fat and skim milk.....	127.04
Milking period per acre.....days..	275	Value of alfalfa hay fed, at \$20 per ton...	7.68
Production per acre:		Net returns per acre of pasture.....	119.36
Milk.....pounds..	5,992.5		
Butter fat.....do....	199.12		
Skim milk.....do....	5,328.8		

B

Cooperative Extension Work in Agriculture and Home Economics

**United States Department of Agriculture and State
Agricultural Colleges, Cooperating**

THE FARM WOMAN'S PROBLEMS

FLORENCE E. WARD

**In Charge, Extension Work with Women
Office of Extension Work North and West**



**UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 148**

Contribution from the States Relations Service

A. C. TRUE, Director

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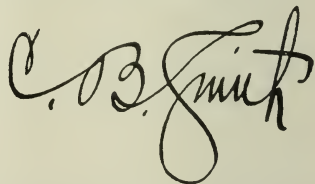
FOREWORD.

In this circular may be found data with interpretations relating to the work and problems of 10,044 farm women in the Northern and Western States, with an indication as to how some of these problems are being met through the aid of home-demonstration agents working in cooperation with groups of farm women.

Before agriculture and rural life can reach its highest development the farm home and the rural community must be made as efficient, as attractive, and as satisfying to the whole family as the farm is to the farmer. This calls for better rural schools, better roads, better health facilities, more modern conveniences in the home, more attention to home beautification, and more time for play, for social life and hospitality among rural people.

Help in the farm home is rare and exceedingly difficult to obtain. The data reported in this paper show that if the farm woman is to take her part in the social and civic life of her own family and the community in which she lives, her work and the conditions surrounding the home must be so adjusted as to make this possible.

Making life in the farm home satisfying is one of the big problems of the open country to-day and one which the cooperative agricultural extension service is helping to meet through the home demonstration agents, whose work is touched upon in this circular.

A handwritten signature in dark ink, appearing to read "C. B. Smith". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Chief, Office of Extension Work, North and West.

THE FARM WOMAN'S PROBLEMS.

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A SURVEY OF FARM HOME CONDITIONS.

The farm home is a vital part of the farm. The business of farming, unlike banking, storekeeping, and manufacturing, is a family matter. The wife is a necessary partner in the business. Heretofore much attention has been given to the farm and the farmer, but relatively little to the farmer's wife and the home.

With the desire to extend to the farm woman the most practical and acceptable assistance possible in promoting her work, the Department of Agriculture, in cooperation with the State colleges of agriculture and county farm bureaus, made in 1919 a survey of about 10,000 representative farm homes in the rural regions of the 33 Northern and Western States to learn from the farm women themselves their real problems and how the extension service may aid in solving them.

This survey is believed to be one of the most significant pieces of work yet undertaken in the field of farm home studies. One needs but to follow the average woman of the survey through a week's routine to realize her many problems and to gain some conception of the vitality and skill called into play by her duties as cook, seamstress, laundress, and nurse; family purchasing agent; teacher of her children; and factor in community life; as well as producer of dairy, garden, and poultry products.

The 10,000 records received from farm women were secured largely by home-demonstration agents between June and October, 1919. These present convincing evidence as to actual living and working conditions under which farm women are meeting their responsibilities as partners in the farming business, and unmistakably point to certain definite kinds of assistance which the cooperative extension service can extend to rural homes of the Northern and Western States.

one question. For example, 9,767 people answered the question regarding washing and ironing; 9,400, or 96 per cent, stated that this work was done at home. It is evident that in some cases, women filling out the blank laid it down at some interruption and in taking it up again omitted certain questions. Many persons, apparently, assumed that if they omitted a question entirely they were indicating with sufficient clearness that the conditions under discussion did not exist in their families. For example, a large number failed to answer questions bearing upon the number of children of various ages, apparently because they had no children. The same is true of questions dealing with members of the family incapacitated by old age or illness; hired men and hired girls; the vacation or "days off" of the home maker and other points of information. It has, therefore, been necessary to base the average or percentage in each case upon the number of explicit answers instead of on the total number of surveys received, a procedure which results in certain instances in figures somewhat at variance with the actual facts.

In considering the figures of the survey one should realize that it is a composite picture, representing on the one hand a favored small percentage of women whose surroundings, working conditions, and social experiences reach high levels of comfort and progress, and on the other a larger percentage of less fortunately placed women. The resulting outline may give a somewhat exaggerated impression of hardship, unless one thinks of the motive back of the work of wife and mother and the compensations that come to every home maker in her round of activities for the happiness and comfort of her family. Anyone who has experienced the satisfaction of living in the open country knows that the average farm woman is more fortunately placed in many ways than her average city sister. Studies of living and working conditions of city home makers bring to light in many homes not only handicaps in home equipment and conveniences, but an environment detrimental to health, happiness, and development. The varied interests of the farm woman's life, her contact with growing things, her enjoyment of seasonal changes in nature, and her freedom from noise, dust, and confusion is not to be lost sight of in comparing her conditions and opportunities with those of home makers of urban communities. It is not, however, the purpose of this discussion to go into comparisons, but to present conditions as the survey reflects them.

That marked progress has been made during the past few years in raising rural home standards of living can not be questioned. Every community boasts some homes which exemplify the fact that the country to-day with a reasonable amount of prosperity and good management offers all the traditional freedom and independence of

rural living with most of the hardships of former days eliminated. The telephone and the automobile in large measure free the farm family from isolation. Modern machinery for farm and home eliminates the drudgery from field and kitchen. Rural engineering has mastered the problems of sanitation for the farm home. Community centers make possible wholesome and inspiring social contacts and mediums of self-expression. Yet with all these modern resources which are taken advantage of and enjoyed by many progressive and prosperous farm families, there is still a large percentage of the farm homes in this country, according to the figures of the survey, not yet feeling to any marked degree the influence of these life-giving factors. It is the realization of this need that prompts the Department of Agriculture and the State colleges of agriculture to offer the service of extension work with women, a work which would not be needed if all homes had reached the high state of comfort and efficiency attained by the few.

ECONOMIC IMPORTANCE OF THE FARM WOMAN.

The survey indicates that much loss to family and community through waste of woman power could be prevented by a reasonable amount of planning and well directed investment in modern equipment.

Everywhere we hear of the economic importance of a contented rural population willing to stay on the land and help to build it up. Perhaps the greatest factor in bringing this about will be the healthy, alert, and expert home makers who, with the other members of the farm family, will see to it that a part of the increased income from the farm is directed toward the improvement of the home as a means of contentment and stimulus for farm work. Economists of our country, seeing the steady migration cityward, recognizing the dearth of farm labor as a limiting factor in production, and connecting this with the isolation and inconvenience of rural living conditions, are pointing out that where these exist it is doubtful business policy to use increased income to buy more land with heavy interest charges against it rather than to spend part of that income in raising standards of living so that farm women may find contentment in comfortable homes, and young people need not go to the cities in search of attractive living conditions and a satisfying social life.

Statistics show that larger numbers of young women than of young men are leaving the rural districts for the cities. In many localities the influence of the home-demonstration agent has been most telling in helping young women to realize their economic importance in agricultural and home pursuits, and to discover sources of incomes from the land equal to those that can be earned in shop or factory.

The entire purpose which animates the work of the cooperative extension service as it pertains to the home is to help the home maker to so arrange the various departments of her housekeeping that she may secure for herself, her family, and her community the highest possible degree of health, happiness, and efficiency. Hence the facts in this survey become a challenge for increased cooperation with the farming people in placing housekeeping on at least as sound an economic basis as farming itself, and the interest of the Department of Agriculture in these studies of the labor, the working equipment, and the compensations of the farm woman is as practical and as scientific as is its interest in studies of the labor, the machinery, and the crop returns of the farmer, and for the same general reasons.

SOME FACTS FROM THE SURVEY.

WORKING HOURS AND VACATIONS.

In industries, where love and service are not the ruling motives, a walkout might be foreshadowed by conditions brought out in Table I, which shows that the average working day, summer and winter, for over 9,000 farm women is 11.3 hours, and that 87 per cent of 8,773 women report no regular vacation during the year, although a large per cent tell of scattered "days off" in the family automobile.

TABLE I.—*Length of the working day and vacation of farm women.*

Section of country.	Summer.		Winter.		Proportion of women having regular vacation.	Length of vacation.
	Work.	Rest.	Work.	Rest.		
	<i>Hours.</i>	<i>Hours.</i>	<i>Hours.</i>	<i>Hours.</i>	<i>Per cent.</i>	<i>Days.</i>
Eastern.....	13.0	1.6	10.7	2.4	13	12.4
Central.....	13.2	1.5	10.5	2.3	12	10.8
Western.....	13.0	1.8	10.2	2.4	13	16.4
Country wide.....	13.1	1.6	10.5	2.4	13	11.5
Number of records.....	9,530	8,360	9,164	8,164	8,773	1,241

HOUSEHOLD DUTIES.

Table II shows the extent of certain household tasks of farm women. Some of these might be eliminated if the principles of modern business were applied, and labor and time spent on others might be lessened if the average farmhouse were as well equipped as the up-to-date home or even the up-to-date barn, the appliances of which the farmer looks upon as so much currency with which to buy efficiency.

TABLE II.—Some household duties of the farm woman.

Section of country.	Rooms to care for.	Stoves to care for.	Care for kerosene lamps.	Carry water.		Do own washing.	Do own sewing.	Daily mending.	Do own bread baking.
				Percentage.	Distance.				
	<i>Number.</i>	<i>Number.</i>	<i>Per ct.</i>		<i>Feet.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Hours.</i>	<i>Per ct.</i>
Eastern.....	9.7	1.3	81	54	23	94	86	0.5	89
Central.....	7.7	1.3	79	68	41	97	94	.6	97
Western.....	5.3	1.1	74	57	65	97	95	.5	97
Country wide.....	7.8	1.29	79	61	39	96	92	.6	94
Number of records.....	9,781	9,224	9,896	6,511	6,708	9,767	9,724	8,001	9,614

MODERN EQUIPMENT BRINGS HEALTH AND LEISURE.

Lighting.—The installation of a modern lighting system would release some time in the 79 per cent of 9,896 homes where kerosene lamps are used. The initial cost would be small when weighed against convenience and comfort.

Heating.—The average farm woman has an 8-room house to keep clean. Nine thousand of these houses are supplied with from one to two stoves, not counting the kitchen range. These add to the daily work of 54 per cent of the rural women who when heat is needed not only carry into the house the coal or wood to feed these stoves, but, according to their statements, keep the home fires burning throughout the day. This condition could be greatly improved by some type of modern heating equipment placed in the basement which would keep the whole house comparatively warm and usable throughout the winter, and prevent the congestion that results when the winter living quarters are limited to the kitchen and one or two other rooms. The normal town dweller keeps all parts of his house comfortably warm, but all too frequently the farm family contents itself with going to bed in chilled rooms, and fails to connect lack of warmth and of facilities for bathing and dressing with ailments and resultant doctor bills whose expense would in many cases pay for a modern heating system.

Power.—As power on the farm is one of the greatest time and labor savers for the farmer so power in the home is one of the greatest boons to the housewife. Forty-two per cent of the homes answering the question reported power for operating farm machinery. When we consider that it is often a simple matter to connect the engine used at the barn with household equipment it seems a singular fact that but 15 per cent of the farm homes reporting have this advantage. Power for such frequently recurring tasks as sweeping, running the washing machine, and churning would greatly relieve the farm

woman and give her a satisfying sense of modern efficiency. The eastern section reports 35 per cent power on the premises, and 8 per cent in the home. One State reports 7 per cent, and another—the lowest—2 per cent of power machinery in the home. One State—the highest—shows 47 per cent of power in the home with 72 per cent on the farm. The one next highest shows 44 per cent in the home and 78 per cent on the farm.

Running water.—It is frequently stated that running water is the pivot upon which much modern convenience and comfort turns. Only 32 per cent of the homes answering the questions report running water, that is, water drawn from a faucet, and possibly available for use in other rooms besides the kitchen. Sixty-five per cent of the homes have water in the kitchen only, that is, supplied directly from a pump or possibly by means of a rubber hose attached to a barrel located inside or outside of the kitchen. However, in 60 per cent of the homes there is a sink with drain, even though in many cases the water used has to be carried into the house by the pailful. In 61 per cent of the 6,511 homes into which the water must be carried this work is done by women. Of 9,679 women answering the question 20 per cent have bathtubs in their homes. The State ranking highest reported 48 per cent of homes having bathtubs and the one ranking lowest 3 per cent.

No one single thing brings so much relief to farm women in meeting their endless tasks as does the use of running water. It is undoubtedly the greatest need in rural-home life to-day on more than two-thirds of the farms. The advent of the bathtub, the indoor toilet, and other conveniences dependent upon running water, bring not only untold release from drudgery but a sense of pride and ownership which is as important a factor in a woman's success in her daily round of work as is modern machinery in the success of the farmer.

Table III summarizes some of the more important data regarding the equipment of the farm homes surveyed.

TABLE III.—*Equipment of farm homes surveyed.*

Section of country.	Run- ning water.	Power ma- chinery.	Water in kitchen.	Wash- ing ma- chines.	Carp- et- sweep- er.	Sewing ma- chines.	Screen- ed-win- dows and doors.	Out- door toilet.	Bath tub.	Sink and drain.
	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>
Eastern.....	39	8	85	52	58	94	95	79	18	80
Central.....	24	22	60	64	46	95	98	89	19	52
Western.....	36	12	45	48	29	95	91	86	25	44
Average.....	32	15	65	57	47	95	96	85	20	60
Number of records.	9,374	9,080	9,374	9,580	9,513	9,560	9,667	9,580	9,679	9,334

HIRED HELP.

The survey shows the passing of the "hired girl," once so important a factor in the economic and social life of the farm home. The answers received regarding help by the month and by the day are, as noted earlier, somewhat ambiguous. They may be interpreted to mean, however, that the number of homes employing hired women the year round is almost negligible, while about 14 per cent of the 8,693 families reporting employed hired women for short periods, perhaps during the peak of the heavy summer work. The average period during which such assistance is available is 3.6 months, the largest number of hired women and the shortest term being in the eastern section, the smallest number of hired women and the longest term of service being in the western section. From 8 to 10 per cent of the homes seem to employ women to help by the day an average of $1\frac{1}{4}$ days per week. This assistance seems to be mainly for laundry work and cleaning. The percentage of homes employing such help by the day is larger in the eastern section than in the central and western sections. The growing scarcity of domestic help only further emphasizes the necessity for simplifying the housework and providing the farm home with all modern labor-saving devices.

OUTDOOR WORK.

In addition to her various duties in the house, the farm woman is a productive worker on the farm, as evidenced by the figures shown in Tables IV, V, and VI. These figures show that 36 per cent of the women reporting help with the milking of the family herd, 56 per cent take most of the care of the garden, 81 per cent care for the chickens, 25 per cent help with the live stock, and 24 per cent help in the field an average of 6.7 weeks during the year.

TABLE IV.—*Outdoor work and keeping accounts.*

Section of country.	Help with live stock.	Help in field.		Care for gardens.	Keep farm accounts.	Keep home accounts.
		Per-centage.	Weeks per year.			
	<i>Per cent.</i>			<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Eastern.....	24	27	8.5	41	28	23
Central.....	26	22	4.9	67	34	33
Western.....	27	23	6.7	57	33	34
Average.....	25	24	6.7	56	32	30
Number of records.....	9,365	9,179	2,196	9,526	8,730	8,750

The dairy.—Table V shows that 33 per cent of the 8,498 farm women reporting make butter to sell. Since butter making, either for home use or for sale, adds one item to the farm woman's over-

crowded schedule, it would seem to be justified only when a good creamery is not within reach. Experts advise that normally the best utilization of milk is to send the surplus to a creamery, after reserving an ample supply for home use, as the income from the dairy herd is usually greater when the product is handled by the creamery than when butter is made at home.

TABLE V.—*Woman's part in the work of the dairy.*

Section of country.	Cows per farm.	Help to milk.	Wash milk pails.	Wash separator.	Make butter.	Keep records of butter money.	Sell butter.	Have butter money.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Eastern.....	8.0	24	85	50	43	22	31	9
Central.....	6.8	45	93	76	66	30	33	9
Western.....	4.8	37	85	63	74	36	33	16
Average.....	6.8	36	88	65	60	29	33	11
Number of records...	9,570	9,342	9,361	8,817	9,190	6,356	8,498	5,354

Accounts.—Getting the most from a dollar and making sure that the home industry pays is recognized as an essential part of good business by 30 per cent of the 8,750 answering the question regarding household finances, who stated that they were keeping home accounts (Table IV). Thirty-two per cent were also keeping farm accounts. The records of those reporting show that 11 per cent of those selling butter and 16 per cent of those selling eggs have the money for their own use.

Poultry.—Results of studies by poultry specialists agree in general with the figures in Table VI, which show that 81 per cent of all poultry flocks covered by the survey is cared for by women, the largest per cent (89) being in the Middle West.

TABLE VI.—*Care of poultry, keeping records, and money returns.*

Section of country.	Caring for poultry.	Average size of flock.	Have poultry money for own use.	Have egg money.	Keep records of egg money.
	<i>Per cent.</i>		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Eastern.....	69	90	13	16	38
Central.....	89	102	25	16	51
Western.....	84	71	21	17	41
Average.....	81	90	22	16	45
Number of records.....	9,477	9,742	8,312	8,324	8,628

Community enterprises.—Table VII, indicating an average distance of 5.9 miles to the nearest high school, 2.9 miles to the nearest church, and 4.8 miles to the nearest market, shows that country people are far enough from the center of trade and social and religious activities to develop a spirit of individualism and to put their

neighborliness and piety to the test. It points to the importance of pooling individual interest in common community enterprises, such as canning kitchens, buying centers, markets, laundries, salvage shops, and sewing rooms, as well as social centers for lectures, community sings, dramatics, and games, which, if properly handled, overcome the isolation of country homes and make possible the accomplishment of many otherwise difficult tasks with a saving of time and labor for the housewife, and often afford an opportunity for increased income as well as recreation for the entire family.

The automobile contributes materially to community life by reducing the distance factor. It will be noted in Table VII that an average of 62 per cent of farms of the 9,545 reporting own cars, with the largest percentage (73) in the Middle West. The telephone also helps to overcome distance and isolation in 72 per cent of the 9,748 homes reporting. In this respect the Central West shows an advance over other sections, with 85 per cent of the farm homes reporting telephones.

TABLE VII.—*Distances, automobiles, and telephones.*

Section of country.	Miles to district school.	Miles to high school.	Miles to church.	Miles to market.	Miles to family doctor.	Miles to nearest hospital.	Miles to nearest trained nurse.	Family used auto.	Homes having phones.
								<i>Per cent.</i>	<i>Per cent.</i>
Eastern.....	1.2	4.3	1.9	3.1	3.5	12.8	9.9	48	67
Central.....	1.6	5.1	2.6	4.6	4.9	12.7	11.8	73	85
Western.....	1.7	9.6	5.1	7.7	10.4	17.7	15.5	62	56
Average....	1.5	5.9	2.9	4.8	5.7	13.9	11.9	62	72
Number of records.....	9,627	9,767	9,726	9,708	9,837	9,605	9,463	9,545	9,748

HEALTH.

Fortunate is the farm family whose members know the rudiments of caring for the sick and have an emergency kit fitted up and at hand. According to figures in Table VII, the average farm home is more than $5\frac{1}{2}$ miles from the family doctor, nearly 12 miles from a trained nurse, and about 14 miles from a hospital. These distances are shortest in the eastern section and longest in the western section. This means that even though the farm home be provided with an automobile and a telephone, the farm family may be obliged to act unaided in case of sickness, childbirth, or serious accident, and that its members perhaps need more than ordinary training to prepare them for such exigencies. Of 6,223 homes answering the questions regarding members partially or totally incapacitated by old age or chronic illness, 1 out of every 8 reported a member partially incapacitated, and 1 out of every 33 a member totally incapacitated.

Along with proper nutrition, clothing, and exercise, sanitary conditions have an important bearing on the health of the children and adults on the farm. On the basis of 9,580 reports, 85 per cent of rural homes still have outdoor toilets. Only 20 per cent (9,679 answering) have bathtubs, and this does not necessarily imply that 20 per cent have hot water in connection with the tub. Almost universally the houses are screened, as indicated by the 96 per cent of 9,667 homes reporting. The screened kitchen porch is found, however, in but 32 per cent of the 9,502 homes reporting.

CHILDREN.

Among the surprises in tabulating the surveys was the small number of children in the farm homes, 7,467 reports showing an average of but 1.18 under 10 years of age for each home, and but 0.89 for each home between 10 and 16 years of age. It may be of interest here to note that the number of children in rural homes of the East falls below the country-wide average, the report showing 0.98 under 10 years and 0.77 between 10 and 16 years, on a basis of 2,573 reports. The number of children per home is highest in the western section, 1.4 under 10 years (1,734 reports) and 0.97 between 10 and 16 years (1,923 reports). About 2,600 homes neglected to answer this question, probably because there were no children, so the figures quoted above can not be regarded as too low.

Child life is a vitally important factor in rural districts, and for the future of our agriculture, if for no other reason, as intelligent an effort should be made and as much money should be expended to safeguard the child life on the farm as to safeguard other life that has to do with the building up of the farm. A large amount of underdevelop-

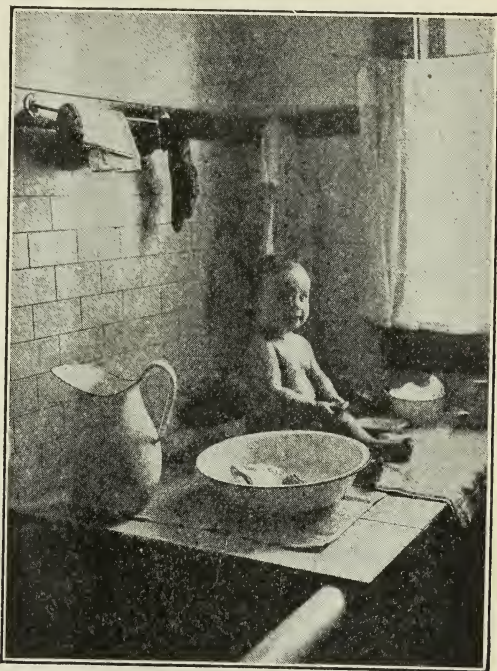


FIG. 2.—Convenient arrangement for bathing a small baby.

The survey shows that the average number of children in the farm home is surprisingly small and that the amount of underdevelopment and malnutrition is large. Conservation of child life is one of the greatest problems and duties of the farm woman.

ment and malnutrition in rural children, and this irrespective of the prosperity of the homes from which they come, has recently been revealed by weighing and measuring tests in many localities. A campaign to bring farm children up to normal standards of nutrition and development should arouse greater enthusiasm and command greater support than campaigns in the interest of cow testing or poultry culling.

SIDE LIGHTS FROM THE SURVEY.

Interesting side lights revealing what was really in the minds of some of the farm women when they filled out the blanks of the survey are shown by comments written as footnotes or on sheets attached. These original and intimate expressions of opinion and conviction, which range from comments on individual difficulties or advantages to analysis and philosophy of the bigger issues of country living, are counted among the most precious records received by the department.

Briefly stated, here are some of the points of view expressed:

Farm women love the country and do not want to give up its freedom for city life. What they do want is normal living and working conditions in the farm home. "The country offers greater opportunity for satisfying life than the city, and country women have as great capacity as city women for the enjoyment of life, but are more handicapped with routine which absorbs their time and strength."

Because of the shortage of help prevalent throughout the country, women consider it especially important that modern equipment and machinery, so far as possible, do the work which would otherwise fall to women.

The questions are asked: "Does the farmer lack business sagacity who invests in the sulky plow, used only during one season of the year, and puts off the purchase of the washing machine?" "Is it an error in judgment to justify outlays which result in better crops and buildings and consider home investments an extravagance?"

The farm woman does not wish to put up with an unsatisfactory to-day in the anticipation of something better to-morrow or in her old age, but wants a chance to enjoy to-day as the only possession she is sure of. She feels that she owes it to herself and her family to "keep informed, attractive, and in harmony with life as the years advance."

Women realize that no amount of scientific arrangement or labor-saving appliances will of themselves make a home. It is the woman's personal presence, influence, and care that make the home. House-keeping is a business as practical as farming and with no romance in it; home making is a sacred trust. "A woman wants time salvaged from housekeeping to create the right home atmosphere for her

children, and to so enrich their home surroundings that they may gain their ideals of beauty and their tastes for books and music not from the shop windows, the movies, the billboards, or the jazz band but from the home environment."

In the minds of many women is the thought that the man at the head of the house lives under a strain of hard work and competition and that "for him to have a comfortable fireside and a family that is happy, healthy, well fed, well clothed, well sheltered, and contented is his right and his greatest boon."

The farm woman knows that there is no one who can take her place as teacher and companion of her children during their early impressionable years and she craves more time for their care. She feels the need of making the farm home an inviting place for the young people of the family and their friends and of promoting the recreational and educational advantages of the neighborhood in order to cope with the various forms of city allurements. She realizes that modern conditions call for an even closer contact and deeper sympathy between mother and child. The familiar saying, "God could not be everywhere so He made mothers," has a very practical application, as no amount of education and care given to children in school or elsewhere outside the home can take the place of mothering in the home. "The home exists for the child, hence the child's development should have first consideration."

Farm women want to broaden their outlook and keep up with the advancement of their children "not by courses of study but by bringing progressive ideas, methods, and facilities into the everyday work and recreation of the home environment."

The farm woman feels her isolation from neighbors as well as from libraries and other means of keeping in touch with outside life. She counts her favorite farm paper or woman's magazine among her valued aids. She believes that farm women should come together more often in organized groups to learn from each other and to gain a mastery of their problems through united effort. "The farmer," she declares, "deals much with other men. The children form associates at school but we, because of our narrow range of duties and distance from neighbors, form the habit of staying at home and to a greater degree than is commonly supposed feel the need for congenial companionship."

Thus the farm woman, who has sometimes been considered conservative and inclined to question the value of things new and untried, expresses openmindedness and a forward-looking spirit. When she is aroused and convinced that any new step in advance is for the best interests of her home, she will be found progressive, cooperative, adaptable, and ready to make changes, no matter how great the personal effort or sacrifice.

OUTSTANDING PROBLEMS REVEALED BY THE SURVEY.

The five outstanding problems, which the survey would indicate call for special consideration, are:

- (1) Shortening the working day of the average farm woman.
- (2) Lessening the amount of heavy manual labor she now performs.
- (3) Bringing about higher standards of comfort and beauty for the farm home.
- (4) Safeguarding the health of the farm family, and especially the health of the mother and growing child.

(5) Developing and introducing money-yielding home industries where necessary in order to make needed home improvements.

These problems may most speedily be solved by:

(1) Introducing improved home equipment, principal among which are running water and power machinery, and adopting more efficient methods of household management, including the rearrangement of the inconvenient kitchen and the installation of a modern heating system for the whole house.

(2) Helping farm people to understand and apply the laws of nutrition and hygiene through home demonstrations in child care and feeding and food selection for the family, and through training in the essentials of home nursing and the installation of sanitary improvements.

(3) Cultivating the idea that investment in the comfort, beauty, health, and efficiency of the farm home and the rural community is a wise and legitimate expenditure and perhaps the only means of stopping the drift of young people to the city.

THE SURVEY AND THE EXTENSION SERVICE.

The composite picture of the activities and environment of a large group of farm women naturally raises the question as to what steps are being taken to relieve these women of some of their present handicaps. In reply it may be stated that for some years the home-economics pioneer has given her service to the housewife. Since the passage of the Smith-Lever Act the home-demonstration agent has become a factor in extension work with the home. The data here presented serve a dual purpose; first, they offer a reliable and much-needed guide to extension workers in their service to the home, and, second, they demonstrate to the farming people and others interested the great value of trained assistance to farm women along definite lines.

In endeavoring to develop the broad educational extension movement made possible by the Smith-Lever Act, the State colleges of agriculture and the States Relations Service of the United States Department of Agriculture have had a much more limited background of facts on which to base plans for cooperation with rural

housewives than with farmers. This is because comparatively little attention has been given to farm-home problems, although the farm woman's work has as great economic importance and calls for as high a degree of skill and as wide a range of information and judgment as does the work of the farmer whose equipment and methods of farming have been the subject of many studies made by our agricultural institutions.

With the exception of the investigations of the Country-Life Commission appointed by President Roosevelt in 1908 (S. Doc. 705) and the inquiry as to farm-home conditions made by Secretary Houston in 1914, replies to which were compiled and interpreted (Yearbook 1914; also Reports 103, 104, 105, and 106), and two intensive studies of counties made by the States Relations Service (Canyon County, Idaho, 1916; St. Joseph County, Mich., 1916), comparatively little has been done in this field which throws light on farm-home conditions in the North and West; hence the importance of the present survey, which, resting upon information from many communities, probably gives a fair diagnosis of farm-home conditions, and when interpreted by extension workers and farming people should point to remedies which may be applied through organized effort and local leadership.

THE FARM BUREAU.

With the development of the farm-bureau idea, now nation wide in its influence, which promotes a self-determined program of activities among the people for the economic and educational advancement of rural life, the farmer and his wife are destined to analyze their home problems more and more closely, and to make use of the farm-bureau organization and the extension service for the solving of those problems,

The farm exists for the home as truly as the home exists for the farm. There men, women, and children form a working unit, with common interests and aims, and the farm bureau, dealing with this family unit and with community groups, views home work not as isolated and detached from the farm but as one phase of the problems of the farmstead. Men and boys work primarily with production in the business of farming and women and girls with utilization and conservation in the business of housekeeping, but all come together in a common interest and for a common goal—home making. Farming and housekeeping are not ends in themselves, but necessary means to the realization of this goal.

Prosperity on the farm and efficiency in the house in their last analysis are only valuable as they make people better, wiser, and happier by creating and multiplying opportunities for richer and more satisfying rural home and community life. Hence all extension

forces—the county agricultural agents, home-demonstration agents, club agents, and specialists—are working in their respective fields with this larger aim and purpose. This brings about constant interchange of effort and service. For example, the farm woman's interests and activities go beyond the threshold of her house, when necessary, into such work as poultry raising, bee keeping, and marketing of home products. In this she frequently has the help not only of the men folks at home but of the county agricultural agent, the club agent, and men specialists from the college. She may also call upon these for advice and assistance in looking after the water supply and other phases of home improvement. Women extension workers also frequently go out of their special field of home-economics work to give



FIG. 3.—Home-demonstration agent delivering fireless cooker parts ordered by farm women.

One of the most useful and appreciated services of the home-demonstration agent is in connection with the introduction of labor-saving devices.

advice and assistance, thus expressing, it is believed, the true spirit of the Smith-Lever Act, which, drawn in broad language, refers equally to the service of the farm and home and includes all phases of work that effects wholesome farm life.

THE HOME-DEMONSTRATION AGENT.

Women are everywhere welcoming the services of the home-demonstration agent much as farmers welcome the county agricultural agent. This trained home-economics worker, employed with Federal, State, and local funds and devoting all her time to the advancement of home efficiency, is studying with home makers the needs of individual homes and communities and is thus able, by linking her technical skill with the practical knowledge and experience of the house-

wives, to cooperate in the accomplishment of large results by providing a channel through which the State agricultural college and the United States Department of Agriculture can deal directly with rural home makers.

Increased moral and financial support of local communities during the fiscal year 1919-1920 for the nearly 300 agents now employed has shown the belief of the people of the North and West in home-demonstration work and placed it on a promising basis, which looks toward its establishment eventually in every agricultural county.

HOME-ECONOMICS SPECIALISTS.

Closely associated with the home-demonstration agents are the specialists in various branches of home economics, with headquarters at the agricultural colleges. These are women intensively trained in their special subjects, who strengthen the work of the agents on the side of subject matter and methods. The forerunner of the specialist of to-day was the general home-economics worker who in many States preceded the home-demonstration agent, with the college as her headquarters and the whole State as her field of work.

A few examples of activities will show something of what is being accomplished through the partnership of the housewife, the home-demonstration agent, and the home-economics specialist in solving some of the live problems brought out in this survey.

ACTIVITIES.

Clothing.—Replies to the survey indicate that over 75 per cent of rural home makers do a large part of their own sewing; therefore anything that shortens the time the farm woman spends on the family sewing or helps to make or select garments that give better satisfaction for a given expenditure of time and money, and especially anything that helps her reduce clothing expenditures in this era of inflated prices, meets a real need.

The annual report of home-demonstration work for 1919 shows that clothing specialists and home-demonstration agents aided through direct teaching and training of volunteer leaders in the making or remodeling of 30,000 garments at an estimated saving of \$218,000.

Home management.—The annual report of the home-demonstration agents for 1919 indicates that a decided advance was made last year in the business side of housekeeping. One hundred and sixty-six counties where home-demonstration agents were employed carried on some sort of county-wide campaign for increased home efficiency.

One thousand and seventy-seven farm families were assisted in rearranging the farm house or kitchen as an important first step in efficient housekeeping, the largest number reporting from Iowa.

School lunch.—The hot school lunch project in which extension workers have had a prominent part, has been most successful. The

survey indicates that the average country school is about $1\frac{1}{2}$ miles from the home, which makes it impossible for the country child to share in the hot midday dinner prepared for the family. An examination of the school dinner pail or lunch box too frequently reveals that unappetizing or indigestible food is the underlying cause for lack of appetite and restlessness on the part of school children. Well-selected food, attractively packed, and supplemented by one simple hot dish prepared by the pupils at school has resulted in improved health and better school records. The school lunch has also proved to be the opening wedge for the study of food selection in the



FIG. 4.—Clothing project leader training local women who will instruct others
In this way farm women in the Northern and Western States were last year assisted in making or remodeling 30,000 garments at an estimated saving of \$218,000.

home, not only for the child but for the whole family, and has increased the use of milk, cereals, and vegetables in the diet.

Milk and milk products.—Home-demonstration agents are cooperating in milk campaigns for increased use of milk and milk products in the home and for the home manufacture of such milk products as can be most economically handled there. Reports of these agents for 15 States for the year 1919 show that 367,000 pounds of cheese were made by the housewives to whom home-demonstration agents and dairy specialists had given assistance in the best methods of making cottage, American, and Cheddar cheese both for home consumption and to sell.

It is claimed by those who have made investigations that 25 per cent of country children do not drink milk. A definite drive is now

being carried on to persuade country children to drink more milk, and feeding demonstrations are being conducted by home-demonstration agents in cooperation with parents and teachers to this end.

One State reports the increase in the home consumption of milk to be 438,000 quarts daily; another State, where home-demonstration work was carried on in only six counties, reports an increase of 279,000 quarts per day as a result of this work. In Indiana one home-demonstration agent, in cooperation with the school nurses and doctors, proved the value of the increase of milk in the diet by putting on a child-feeding demonstration with a group of undernourished children. At the end of seven weeks an average gain of $3\frac{1}{2}$ pounds



FIG. 5.—One of the important problems of farm women is the school lunch.

had been made, and the school board voted funds to carry on the enterprise.

Home health and hygiene.—One of the outstanding extension projects during the past year has been that of health. This has included demonstration in first aid, the elements of home nursing, preparation of food for sick and convalescents, and preventive hygiene. It is gratifying to know that 202 counties have adopted a home-health project and that 28,000 families have cooperated with home-demonstration agents in an endeavor to improve their own and their neighbors' health. Ohio, Illinois, Minnesota, Missouri, Kansas, Nebraska, and Idaho have employed graduate nurses as home-health specialists.

Productive activities outside the house.—The service of the home-demonstration agent is not confined to the house, but may follow the woman into the garden, the poultry yard, and the dairy to assist her in outside tasks. Often when the woman lacks even small re-

sources to bring needed comfort and beauty to the home, such industries as poultry raising and gardening provide the needed increase in income from which all the family may derive benefit. Judgment as to relative values must, however, guide the home maker in determining the amount of outdoor work it is profitable for her to undertake either as a money-making scheme or as a means of producing food for the family table. It is poor business from every standpoint if work out of doors means overstrained nerves and muscles resulting from an attempt to take on these duties without releasing any household tasks, or if it means neglect of housework or sacrificing attention to children, with a consequent lowering rather than raising of the standard of living.



FIG. 6.—County project leader, dairy specialist, and three agents discussing details of the county dairy project.

Concerted efforts are being made by extension workers to improve the quality and increase the home consumption of milk, particularly by children, and to encourage wherever practicable the home making and use of other dairy products.

Work with poultry.—Poultry work has been promoted in several States through demonstration along lines of poultry selection, breeding, raising, feeding, housing, culling, canning, preservation of eggs, and cooperative selling of poultry products. Since culling demonstration proved to farm women that 40 per cent of the average flock is nonproductive, poultry culling has been adopted as a general practice.

Community enterprises.—The socializing influence of the many war-emergency organizations is now being capitalized by home-demonstration agents who are assisting communities to tie up these temporary enterprises with permanent activities in connection with efficient home making.

There are two effective means of reducing home drudgery. One is the introduction of modern labor-saving equipment in the home. The other is the removal from the home of such activities as can be carried on as cheaply and as successfully through community cooperation as by traditional home methods. Since survey replies indicate that 96 per cent of rural women do their washing and ironing, it would seem that such an activity might well be removed from the home and handled through community cooperation, releasing each week many hours of the woman's time and saving her from one of her heaviest household tasks. Experience in a number of communities indicates that a cooperative laundry, especially when run in connec-

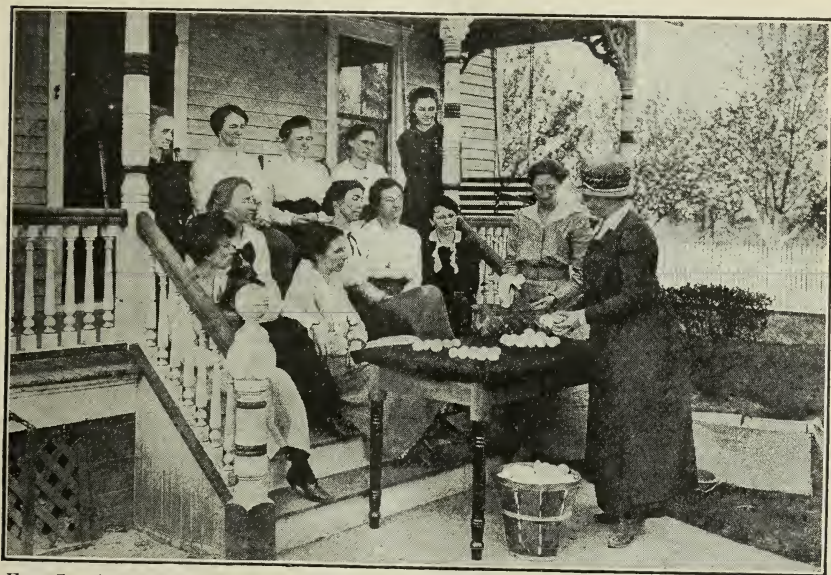


FIG. 7.—An egg circle being instructed by the home-demonstration agent in grading and packing eggs.

Eighty-one per cent of the poultry flocks in the territory covered by this survey are cared for by women, poultry and egg production being among the most important sources of income of the farm home.

tion with a creamery, is not only a convenience but a paying investment.

Recreation.—Community working and trading centers mean much to rural women not only from the standpoint of economy, time, money, and effort, but as means of persuading the stay-at-home to walk through her gate and down the road to join her neighbors in some task which is made lighter through cooperation, and from which she returns refreshed and encouraged with new ideas and plans not only for her own housekeeping but for the larger housekeeping of her neighborhood. No amount of socialized work, however, can take the place of real recreation, for it looks too earnestly toward a finished result. Care-free recreation for the delight of the moment eases nervous tension, promotes good fellowship, and is as necessary for the

mental and physical poise of men and women as it is for boys and girls. Where no other agency is meeting this need, home-demonstration agents frequently cooperate with farm families in home and community recreation, which includes games, chorus singing, dramatization, and pageants.

The conviction is growing in the minds of extension workers everywhere that while it is their first business to promote efficiency, this should be looked upon as a means of stimulating a richer and more satisfying rural life by freeing the home maker's time and energy so that she may give attention to the attractiveness and comfort of her home, the training and companionship of her children, the enjoyment of books and neighbors, and the building up of recreational, social, and educational life in her community. This will increase the per-

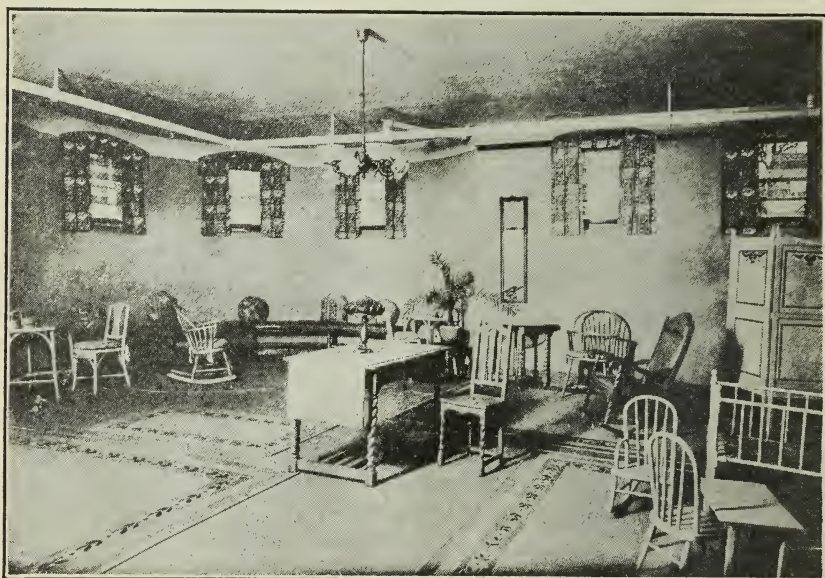


FIG. 8.—A community rest room, Anderson County, Kans. Only small expense is necessary to transform even a basement room into an attractive place where on market or shopping days farmers' families may rest and read.

centage of active thinking women of service to society and reduce the percentage of passive slaves of routine whose daily tasks have degenerated into a continuous round of drudgery.

FUTURE STUDIES.

It is hoped that the survey just completed by farm women themselves in cooperation with home-demonstration agents is but the first of a series of intensive studies which will from time to time be made not only to show the needs but to mark the advancement that is sure to come as the Government, colleges, and farming people work together on a common program for better agriculture and a richer rural life.

B

COOPERATIVE CANE-SIRUP CANNING: PRODUCING SIRUP OF UNIFORM QUALITY

By
J. K. DALE



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CARL L. ALSBERG, Chief

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COOPERATIVE CANE-SIRUP CANNING: PRODUCING SIRUP OF UNIFORM QUALITY.

INTRODUCTION.

Among the crops that can be grown profitably in the southernmost section of the United States sugar cane is one of the best known. It has long been a favorite. In only one State is it cultivated extensively for the purpose of manufacturing sugar, but in all that section of this country where the climate is suitable it has been cultivated for years for one purpose—to produce a sirup, which, when properly made, is both wholesome and delicious.

Two distinctly different types of sugar-cane sirup are made in this country. Nearly all of one, from the district where sugar is also manufactured, is made by comparatively large, well-equipped factories. For purposes of clarification lime and the fumes of burning sulphur (sulphur dioxide) are added to the juice during the process of manufacture. The resulting sirup has a somewhat different taste and the color is much lighter (having a rather greenish tinge) than the other type of sirup. As this first type of sirup is manufactured in large units and is sold, as a rule, to a few large packers, a discussion of the problems involved in its manufacture and sale do not come within the scope of this circular.

The second type of sirup is that made by the farmers in all the sections of the cane-growing regions outside the sugar-producing area. It is produced mostly by the individual farmer with a simple, inexpensive equipment, though there are a few small factories in the regions where the industry is developed more fully. Generally in the manufacture of cane sirup of this type no chemicals are used in clarification. The impurities and scums that rise to the surface as the juice is heated are skimmed off with care, this process constituting all the cleaning and clarification that is attempted. This sirup is of a reddish color and darker than that which has been treated with sulphur fumes. The taste also differs somewhat from that of the other type, being, when the sirup is well made, milder and smoother.

INCREASE IN PRODUCTION.

Although the first type of sirup, which may be called the "Louisiana type," is made almost wholly in large factories, the quantity of it produced during the past few years has not been as great as that of the

other type, made as it is by hundreds of farmers and planters scattered throughout the whole of the region where sugar cane can be grown. Although each farmer may produce a comparatively small amount of sirup, the total number of gallons made by those who include sirup among the products of their farms reaches pretentious figures. The census of 1910 gives the following statistics for sirup production, showing approximately the amounts of these two types of sirup manufactured in 1909:

	Gallons.
Factory-made sirup (Louisiana type)-----	15,574,943
Farm-made sirup-----	17,508,496
Total-----	23,083,439

The production of both of these types of sirup has materially increased since 1909. The Bureau of Crop Estimates has estimated the total cane-sirup production of the United States for the year 1918-19 as 36,730,000 gallons, of which 12,367,000 gallons were produced in Louisiana. Using the figures given, it may be seen that the production of sirup in Louisiana has increased about 43 per cent, while that of farm-made sirup outside of Louisiana has increased but 28 per cent. There are two reasons why the percentage increase in the amount of farm-made sirup is smaller than that of the Louisiana type of sirup. Since in the southern parishes of Louisiana cane is the principal crop and sugar the chief product, to increase sirup production it is necessary only to manufacture sirup from cane that otherwise would be given over to sugar production. In the other sections of the South, where sirup is the only product manufactured from the sugar cane, an increased sirup production means necessarily an increased acreage planted in cane. In the second place, peculiar conditions and difficulties involved in the handling and marketing of cane sirup exist in many regions, decreasing the amount of sirup that is produced.

CLASSES OF SIRUP PRODUCERS.

The farmers who make sirup may be divided into three classes: First, those who raise as much cane as is practicable in their general scheme of crop rotation and find a ready cash market for any amount of sirup that they make; second, those who, on account of climate, soil conditions, or other reasons, can raise a very small amount of cane each season, the small quantity of sirup made being consumed by their families and their neighbors; third, those who could increase the

¹ This figure includes the sirup made in Louisiana as given in both the manufacturers' census and the agricultural census and also the amount of sirup made in Texas as shown by the manufacturers' census. It does not include the returns from 22 mills in Louisiana that failed to send in a report. The author estimates that these 22 mills made not less than 1,500,000 gallons, thus giving a total of over 7,000,000 gallons as the production of the Louisiana type of sirup.

cane acreage of their farms but who find that they are unable to market more than a limited amount of sirup, any surplus being left on their hands or disposed of with difficulty.

The class into which a producer falls is usually dependent upon his environment. In one district all the sirup produced, though it amounts in the aggregate to a large quantity, can be sold readily. In the second district the local demand takes care of all that the farmers care to produce in rotation with their other crops. Finally, there are numerous districts in the cane-growing area where the farmers could and would gladly increase their cane acreage if they could find a ready market for an increased output of sirup, a market which would expand as their production increased. These districts have reached a stage where their production has grown beyond the local demand, but, on the other hand, has not become large enough to attract the attention of the larger buyers of sirup, the packers, and blenders. It is for the farmers and merchants of the last class, living in districts where a more elastic market for sirup would be welcomed, that this circular is primarily written.

MARKETING THE SIRUP.

Sugar-cane sirup is sold by the farmer either in barrels or in No. 10 cans.² Most of the sirup that is marketed in barrels goes to packers, who can it under sterile conditions and sell it either pure or blended under their special brands or labels. This method of marketing sirup is the customary one in the regions where the farmers consider sugar cane one of their principal crops, raising all of it that the conditions of their farms permit. The sirup is barreled as it comes from the evaporator, then hauled to the nearest town, where it is disposed of immediately to representatives or agents of the packing establishments. No criticism is to be made of this method of marketing sirup. The competition between the different buyers is lively enough to assure, as a rule, a fair price to the producer.

In the districts where the local demand equals the output, the farmers market their sirup in cans, which are filled directly from the evaporator as the sirup is made. The farmers in the districts where the amount of sirup manufactured has outgrown the local consumption continue to use this same method to market their sirup. When they make more sirup than they can dispose of to neighbors and to the merchants of the near-by towns, the surplus is left on their hands. They can not sell this sirup, already packed in cans, to the large dealers, for these buyers wish to buy their sirup in bulk,

² These cans are usually spoken of and sold as holding 1 gallon. However, their actual contents are considerably less.

so that they can pack it in their own type of can and sell it under their own labels and trade-marks.

Practically all individuals, firms, or corporations manufacturing or selling material for direct consumption or utilization by the general public find it necessary to employ salesmen to travel throughout the territory they supply to sell their product. This is no less true in the sirup trade than in any other. For instance, when a farmer produces more sirup than his usual clientele will buy, it is necessary for him to find new fields where the supply of sirup has not exceeded the demand. Obviously, this is, as a rule, difficult for him to do. His farm demands his attention and if he starts out to find a market for his sirup his other activities are likely to suffer. Some farmers have built up gradually a rather extensive market for their product, shipping it in small lots to various places, some of which are quite a distance from home. These men are, to a certain extent, independent of local trade conditions, but even their production of sirup is limited by the ability of their usual customers to consume it. Occasionally a farmer who is situated more fortunately than his neighbors, and who is able to leave his farm without detriment, can go out and seek a market for his sirup. Such men have little difficulty in disposing of all the sirup they can make, for there is no doubt that there is an active demand for a good grade of cane sirup; the great difficulty is getting the farmer in touch with this market. Shipping a few cans of sirup here and there by express is both expensive and unsatisfactory.

The question is often asked, "Why is it not feasible and satisfactory for the farmers of a locality to pool their surplus sirup until one or more carloads are obtained, then ship it to a near-by city or other place where there is a good demand for high-grade sirup?" The answer to this question can be summed up in one phrase, "the nonuniformity of the ordinary farm-made cane sirup." Sirup shipped to distributing centers in large quantities must be handled by commission houses or wholesale grocers, thereby coming into competition with standard, uniform, advertised sirups. A non-uniform, uncertain product always suffers in competition with a product which can be bought with the knowledge that the contents of each package will be the same.

A housewife may purchase a can of sirup, and her family may be so well pleased with it that when it is consumed she may wish to obtain another can of the same brand. If her first purchase was a can of farm-made cane sirup, the probability is that the second can will differ markedly from the first can. Her disappointment in not obtaining the product she had enjoyed and wished to obtain again may end her interest in this class of sirup, and she will turn to

brands of sirup put out by the packers which she knows will be uniform.

Evidently before a farmer can sell an unlimited surplus of sirup otherwise than in barrels to the packers, and this has been shown to be unfeasible in some districts, some method must be devised by which his sirup can be standardized; the contents of all cans must be guaranteed to be of uniform quality. A method for accomplishing this (p. 12) is the establishment by the farmers themselves of cooperative sirup-mixing and canning plants capable of handling the surplus sirup of their community.

SECURING A UNIFORM PRODUCT.

Besides the growing of the cane, the production of sirup involves the evaporation of the cane juice, not a difficult process, but one which requires skill, care, and constant attention. Many factors influence the final quality or grade of cane sirup, causing many variations, though made by the same man, with the same equipment, and from the same field of cane, during the same season. New sirup varies in flavor or taste, color, density, and cleanness. To the same qualities in older sirup may be added the factors of whether or not it has fermented and whether or not it has crystallized.

The quality of sirup does not depend so much upon the equipment which the farmer has at his disposal as it does upon the man who manufactures the sirup. The writer has seen excellent sirup made with the crudest kind of evaporators, while, again, he has seen sirup of very poor quality made with up-to-date, expensive equipment. As long as the kind of sirup made depends upon the ability, taste, and experience of the man who makes it, the quality will vary from farm to farm, and there will be as many different grades of sirup as there are producers. Some sirup makers think sirup should be cooked thick; others prefer to make it thinner. Some are careful and skim the juice well, obtaining a clear, clean sirup, while others, more careless, produce a sirup full of dirt and dregs. The standards set by a sirup producer for himself are not always attained, for it is difficult to skim the juice properly, and it is even more difficult to cook it to just the density desired, unless the evaporation is done by steam. The danger of scorching the sirup or otherwise injuring its flavor must be guarded against particularly.

The natural characteristics of cane sirup render it difficult to produce a uniform product on the farm under present conditions. Sirup that is cooked too thick will sugar, and often a can will be found half full of sugar or filled with a mushy mixture of sugar and sirup. For the local market this does not constitute an objection, since it is known that this sugar can be melted up with or without

the addition of a little water to make an exceptionally delicious sirup. However, this does decrease the sales of cane sirup in the cities and in the regions where cane is not grown and cane sirup is not a well-known product. The people in general throughout this country do not want a mixture of sirup and sugar; if they want sirup they want sirup alone, and if they want sugar they want white granulated sugar, never a mixture of the two.

The other objectionable characteristic, especially of thin sirup, is its tendency to ferment as soon as the weather turns warm, unless it is sterilized and sealed air-tight. As it is difficult for a farmer to can his sirup under sterile conditions, it often ferments if kept until summer and the cans swell and even burst. This naturally constitutes a serious objection to a widespread, unlimited marketing of this type of cane sirup, for no grocer wants to have on his shelves cans of a product in this condition. All of these factors interfere seriously with the successful marketing of an increased and unlimited supply of sirup made and canned by the methods at present prevailing on the farms.

In making a study of cane-sirup manufacture, canning, marketing, etc., at one time nearly 3,000 cans (a carload) of sirup gathered from various localities in a few neighboring counties were opened. The lack of uniformity in this shipment was apparent. More than one-third of the cans had sugared partially, a few had sugared solid, many were half full of sugar, while some were too thin to be classed as sirup. Fifty-odd cans contained sirup that had been made from frozen cane, having an extremely disagreeable taste; in 1 can out of every 10 a bee or a wasp was found, while many of the cans contained smaller insects. It is highly probable that if this carload of sirup had been marketed the buyer would not have purchased another the next season; farm-canned sirup would have lost another friend and received one more "black eye." In fact, it has been the experience of a number of men who have collected as much as a carload of sirup from various farmers and shipped it to a distributing point that it was difficult or impossible to sell another carload to the same customer the next year. Both past experience and the increasing desire among the general public for clean, reliable food products make it evident that cane sirup must be well made, standardized, and packed under sterile, cleanly conditions before it can be marketed successfully on a large scale.

When sirup is marketed in bulk, the principal qualities by which it is graded and sold are taste, color, and density. When marketed in cans, in addition to these qualities, the manner in which it has been packed as judged by its keeping qualities, together with the neatness of the package, must be taken into consideration. All these factors,

in making a uniform, marketable sirup, except color and flavor, can be regulated accurately in a small mixing and canning plant, and even sufficient uniformity of color and flavor can be obtained. Concerning the standardization of color and flavor of farm-made cane sirup, a situation exists that goes a long way toward the solution of this problem—that is, the pride which practically every sirup producer takes in making a good product.

The fact that every community thinks the sirup it produces a little superior to that produced anywhere else is as noticeable as the fact that each farmer likes to have a reputation for turning out a high-grade sirup. The farmers in the sirup-producing regions seem to take more interest and pride in the quality of sirup they make than in any other product of their farms. This commendable spirit has resulted in the production, with the crudest equipment, of very little sirup which is not high grade in flavor and color. Unfortunately, however, even the greatest care in making sirup will not prevent its crystallizing if too thick or fermenting if it is too thin or canned carelessly. In the present stage of sirup making the principal step necessary to secure a uniform brand of sirup in one locality would be the establishment of a sirup-mixing and canning plant the chief function of which would be to bring the sirup to a standard density and to can it under absolutely sterile and cleanly conditions.

It is the author's opinion that density in a canned sirup, together with the absence or presence of sugaring or fermentation, are, within certain limits, the principal factors that are noticed by the consumer in connection with the uniformity of a sirup. As a rule the consumer does not notice slight differences in the color and flavor of the sirup he buys, but changes involving density, sugaring, and fermentation are noticed readily. Excluding scorched and low-grade products, the sirup of a community will generally be sufficiently acceptable as far as color and taste are concerned to make uniformity in these respects possible. The operation of a plant for turning out a uniform grade of sirup would be essentially one of reheating the farm-made sirup and canning it properly. The establishment of such a plant would mean that the farmers making use of it would no longer can their sirup themselves but would bring it to the canning plant in barrels where it would be canned under the proper conditions and standardized during the process.

ORGANIZATION OF SIRUP-CANNING ASSOCIATIONS.

It is desirable that sirup-mixing plants located in areas of production should be owned and operated cooperatively. Such ownership and operation would have a tendency to increase the returns

to the producers and at the same time stimulate production. The absence of a dependable market for farm-made sirup at present and the possibility of better returns per acre from sugar cane if a satisfactory market can be obtained are inducements which should incline farmers to cooperate. If there is a desire to organize cooperative mixing plants such organizations should be incorporated, as it gives the organization a distinct legal status.

More than two-thirds of the States have special laws for the incorporation of cooperative associations.³ Some of these laws provide for organizations formed with capital stock, while others provide for the nonstock form, both of which forms specify that each member shall have but one vote, regardless of his financial interest in the organization, and that dividends shall be paid on the basis of patronage after a certain percentage of the savings have been set aside to create a reserve fund and an educational fund, and in case of a capital stock organization to pay a reasonable rate of interest upon capital invested.

By-laws⁴ should be adopted in which definite working plans are outlined. The initial amount of money required to finance a cooperative organization would not be large. It is estimated that an investment of approximately \$3,000 to \$4,000 in a sirup-mixing plant and \$1,000 or \$2,000 for operating capital would answer immediate requirements. By judicious use of this amount and the employment of bank credit a stock of cans could be purchased and expenses of operation met until the turnover of trade begins.

While the farmers have been accustomed to selling their sirup for cash, in order to protect the individual member from possible loss because of unfavorable market conditions, it is desirable that a system of pooling returns for the products sold should be established. By pooling is meant averaging the returns for products sold during a given period, or for certain shipments, so that if growers have products of the same quality and grade they will receive the same price. In order to make pooling systems successful, strict observance should be given to uniform and effective grading.

³ Among States having cooperative laws may be mentioned: Alabama, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, Wisconsin, Wyoming.

⁴ A suggested form of by-laws with suggested financing plans may be obtained from the Bureau of Markets, U. S. Department of Agriculture, Washington, D. C.

ARRANGEMENT AND EQUIPMENT OF PLANT.

Any outline that can be given for the arrangement of a sirup-canning plant must be necessarily only suggestive. The actual space required for the equipment is small, but ample room must be provided for storage. First, there must be room to store the cans, of which a sufficient number must be on hand before the operation of the plant is started. Then, too, space must be provided for storage of the barrels of sirup as they are brought in, for the empty barrels, and for the finished product. This last provision is not necessary always, as in a well-managed cannery the sirup is shipped out nearly as fast as it is canned, labeled, and crated. If possible a sirup-canning plant should be on a railroad siding so as to save all the labor possible in handling the finished product from the factory to the cars.

The reheating vats should be placed so as to allow the hot sirup to be drawn from them into the cans at a convenient working height from the floor. This arrangement is important, as the capacity of the plant is in a large measure dependent upon the efficiency with which this part of the work is handled.

There are two arrangements possible for the relative positions of the mixing and reheating vats. Either the mixing vat can be placed at or near the level of the floor, in which case it would be necessary to pump the sirup from this tank into the reheating vats, or it can be elevated above the floor level sufficiently high to enable the sirup to flow by gravity from it into the reheating vats. In the latter case it probably would be necessary to install a small derrick to lift the barrels of sirup from the floor to the top of this vat. If the former scheme is preferred and the mixing vat is built near the floor level, the barrels can be emptied into it by rolling them up to the top of this tank on inclined skids. Here the beams should be strong enough to support one or more barrels while the sirup runs out of the bung hole. It is well to allow the sirup from the barrels to empty into this mixing vat through a wire screen, thus removing large insects, trash, large crystals of sugar, and other objectionable material.

The reheating vat or vats should be situated so that the least effort is expended in bringing up the empty cans and taking away the filled ones. The number of reheating vats will depend upon the desired capacity of the plant; the more heating vats in use the more sirup can be reheated and canned in a unit of time. Efficient work requires at least two of these vats, so that one can be filled and heated while the other is delivering its hot sirup into the cans. A bench built in front of the mixing vats just high enough to allow the cans resting on it to be filled without spattering is very convenient. After being filled the cans can be pushed along this bench to the man who caps or seals them as soon as they are filled.

The size and kind of a boiler necessary to furnish steam for the mixing tank and reheating vats must be considered. The amount of steam necessary, regulating the size of the boiler, is, of course, dependent upon the amount of sirup it is desired to can each day. A very large boiler is not necessary as a rule, for the consumption of steam in a sirup-canning plant is not large. For a small plant, canning from 1,000 to 2,000 gallons of sirup a day, a 25- to 30-horsepower boiler should furnish an abundance of steam.

Cans.—The several types of cans on the market and in general use as sirup containers are known as the sanitary can, the solder-top can, the large friction-top, and the small friction-top can. The first two, probably the best general types for material which ferments or decomposes easily, have one disadvantage—they must be sealed by machinery or with special sealers if the work is done by hand. The latter process is slow and unsatisfactory when a large number of cans must be handled. The third class, the large friction-top cans, are the least satisfactory if the sirup is to be shipped or handled to any extent, because the tops are easily sprung loose, allowing some of the sirup to leak out. Often they are not air-tight, and hence not proof against fermentation. Any rough handling loosens the top or makes it come off entirely, with the result that the entire can of sirup will be lost. The last type, the small friction-top can, is considered the most satisfactory by canners who operate mostly by hand labor. These cans have a hole in the top 2 inches in diameter, large enough to enable them to be filled quickly; at the same time they are easily capped with a small, tight seal, giving less chance for leakage. Since the friction cap is much smaller than that of the other type of friction-top can it is much more difficult to loosen; hence the danger of being jarred loose in handling is much lessened. This type of can makes a good, strong, air-tight package, and has the advantage, for the small-sirup packer, of being sealed easily and rapidly.

OPERATION OF PLANT.

The work of a sirup-canning plant would include the following operations: (1) Grading the sirup as received, (2) mixing, (3) reheating and bringing to the proper density, (4) canning, (5) labeling and crating the cans ready for shipment.

1. *Grading.*—Since the sirup made by the farmers is of good quality, usually, the grading is simplified. In some cases it might be necessary to divide the sirup brought to the canning plant into three classes, but as long as the original makers of the sirup keep up their present standard two classes only would be necessary. In the first case the sirup would be divided into three grades—the first or good sirup (and this class it is believed will contain by far the larger por-

tion of the sirup brought in) ; a second or lower grade of sirup ; and finally, a third or very poor sirup, including all scorched sirup, all sirup made from frozen cane, sirup that is too thin, and all sirup that for any other cause could not be mixed with good sirup without lowering the quality of the product too much. This last class of sirup should not be received or accepted by a sirup-mixing and canning plant.

A plant adopting the first of these schemes of grading sirup would turn out two brands of canned sirup, a high-class product made by mixing barrels of grade 1, and a brand of lower quality and cheaper, made by mixing barrels of the second-grade sirup. A plant which adopted the second scheme of classifying all sirup into two classes, good sirup and very poor sirup, the latter being rejected, would turn out one grade of sirup, that made by mixing convenient amounts of all the sirup accepted.

In grading, the color and flavor of a sirup, and to a large extent the density also, can be determined by driving a nail into the barrel, withdrawing it, and observing the appearance and taste of the sirup that oozes from the hole. The density may be determined more accurately by knocking out the bung of the barrel and floating in the sirup a Baumé spindle, an instrument well known to sirup makers as a "saccharometer." It consists of a glass spindle with lead shot in a bulb at the bottom, and the stem contains a scale which reads zero in pure water and runs up to 50°. The thicker a solution or sirup, the higher this spindle will stand in the liquor and the larger will be the scale reading.

The density of a sirup in terms of this scale can be determined easily by allowing the spindle to float in the sirup until it becomes steady and then reading the division of the scale that is just at the surface of the liquid. One very necessary precaution must be taken in the use of this instrument. The same sirup will have a density, as determined by a saccharometer, 4° to 5° lower if it is tested near the boiling temperature than if it is tested while the sirup is at the temperature of the atmosphere. However, as the sirup almost invariably would be tested at the canning plant after it had cooled to the temperature of the air, this variation of the scale reading with the temperature will not play a large rôle in testing the density of the sirup as brought to the canning plant. The difference in the density of the sirup as shown on the saccharometer scale on a cool day and on a warm one will be about one-half degree. Table 1 gives the variation in saccharometer scale readings for different temperatures. This table was determined by allowing a Baumé spindle to float in a cylinder containing hot sirup and reading the temperature and the corresponding degree Baumé at different intervals as the sirup cooled.

TABLE 1.—*Density of sirup at different temperatures.*

Sirup.	210° F.	200° F.	150° F.	90° F.	75° F.	60° F.
	° Bé.	° Bé.	° Bé.	° Bé.	° Bé.	° Bé.
I.....	14.7	15.1	17.2	19.0	19.3	19.5
II.....	32.5	32.9	34.6	36.6	37.1	37.4
III.....	34.7	35.1	37.4	39.1	39.4	39.7
IV.....	36.1	36.4	37.7	39.5	39.9	40.3

The farmers should endeavor to cook their sirup to a water content of 28 per cent. A sirup of this density will measure 39° on the saccharometer scale at a temperature of 60° F. (15.5° C.). This density is a good standard for a sirup-canning plant to adopt as a basis for the price paid or allowed for sirup. More should be paid or allowed for a thicker sirup and less accordingly for a thinner sirup.

Table 2 shows the percentage of water in a sirup corresponding to the degrees Baumé at 60° F.

TABLE 2.—*Percentage of water in sirup.*

Density.	Water.	Density.	Water.
° Bé.	Per cent.	° Bé.	Per cent.
35.....	36.1	40.....	26.3
36.....	34.2	41.....	24.3
37.....	32.2	42.....	22.3
38.....	30.3	43.....	20.3
39.....	28.3	44.....	18.2

A good basis for determining the comparative value of sirups of different densities is to consider the actual amount of sirup that can be obtained from unit quantities of juice of the same initial density. The amounts of sirup, of the density indicated, shown in Table 3, have been obtained from 1,000-gallon lots of cane juice measuring 13° Brix or 7.4° Baumé.

TABLE 3.—*Amount of sirup obtained from cane juice.*

Water in sirup.	Density.	Amount of sirup obtained.
Per cent.	° Bé.	Gallons.
30.....	38.1	145
28.....	39.1	139
26.....	40.1	134
24.....	41.1	129

Working from Table 3, and assuming that sirup of 38.1° Bé. is priced at 50 cents per gallon, the value obtained from 1,000 gallons of 7.4° Bé. juice would be 145×\$0.50, or \$72.50. If the sirup were cooked 1° higher, only 139 gallons would be obtained, but the

value of this smaller amount of sirup should be at least the same as that of the thinner sirup, as it was made from the same amount of juice. Hence the value of each gallon should be $\$72.50 \div 139$, or 52 cents. Figured on a percentage basis, this gives $\frac{(52.1 - 50)}{50} \times 100$,

or 4.2 per cent increase in value for a 1° increase in the density as measured on the Baumé scale. Thus, from the producer's point of view, if the standard 39° Bé. is taken and a fixed price is allowed for sirup of this density, an increase or decrease of approximately 4 per cent of this standard price should be allowed for every degree of variation from this standard.

The greater value of a thick sirup over a thin sirup from the consumer's point of view can be calculated from Table 4.

TABLE 4.—Weight per gallon of sirups of different densities.

Water.	Density.	Weight of 1 gallon.
<i>Per cent.</i>	<i>° Bé.</i>	<i>Pounds.</i>
30.3.....	38	11.2
28.3.....	39	11.4
26.3.....	40	11.5
24.3.....	41	11.6
22.2.....	42	11.7

The valuable part of a sirup is the solid material which is nearly all a mixture of cane sugar and invert sugar. A sirup of 38° Bé. contains 69.7 per cent solid material and weighs 11.2 pounds. Hence, the actual weight of the solid material is 0.697×11.2 pounds, or 7.80 pounds.

In a sirup of 42° Bé. the amount of solid material is 0.778×11.7 , or 9.10 pounds. Assuming that the solid or valuable part of a sirup of 38° Bé. is worth 50 cents, the value of the solid material of a gallon of sirup of 42° Bé. would be $\frac{91}{78} \times 50$, or 58.3 cents. Thus, from the consumer's point of view, a sirup of 42° Bé. is worth 8.3 cents more than one of 38° Bé., or for an increase of 1° Bé. in density the value of sirup is increased $8.3 \div 4$, or 2.1 cents. This figured on a percentage basis gives $\frac{2.1}{50} \times 100$ or 4.2 per cent. It is seen, therefore, that the value of a sirup is increased 4.2 per cent from both the producer's and consumer's point of view for each Baumé degree of increase in density. On this basis a canning plant should allow a certain price for sirup measuring 39° Bé. and add or deduct 4 per cent of this amount for an increase or decrease of 1° Bé. in the density of the sirup.

2. *Mixing.*—The larger the quantity of sirup that can be mixed in one tank at one time, the more nearly uniform in color and taste the sirup in all the cans will be. Although there may be quite a noticeable difference in the color and flavor of the product in individual barrels that are brought to a canning plant, still, after the lower-grade sirup has been rejected, unit mixtures made from 5 or more barrels will be very similar to one another. Quantities of from 5 to 10 barrels of sirup can be mixed conveniently in a tank with an agitator or by hand with a paddle.

3. *Reheating and canning.*—This step is the most important one in canning sirup, for it is during this process that the sirup is brought to the desired density, and receives the sterilization that prevents subsequent fermentation. After the sirup from a convenient number of barrels has been mixed, a portion of it is run or pumped into the reboiling vat, which may be of any suitable shape or size—one holding about 100 gallons has been found to be efficient—and may be of copper, galvanized iron, or wood. For heating the sirup the vat would contain, necessarily, a steam-heating coil, preferably of copper. The operation of this part of the process is simple. After a convenient amount of sirup has been delivered to this vat from the mixing tank the steam is turned on, and it is heated to a point just below boiling. Usually canned sirup containing 28 per cent water is considered thick enough; its density will read $33\frac{1}{2}^{\circ}$ – $34\frac{1}{2}^{\circ}$ Baumé when tested with a saccharometer at a temperature just below the boiling point. If the sirup, just before boiling, measures higher than this a little water may be added to thin it out; if it is too thin, and measures less than this, boiling a few minutes longer will bring it up to the desired density.

The sirup, ready at this point for canning, is drawn directly into the cans from the heating vat by some form of quick opening and closing valve. A thermometer should be kept in the sirup and watched closely to see that the temperature does not fall below 185° F. during the canning process. It may be necessary to turn on the steam occasionally to maintain this temperature. As the cans are filled with the hot sirup they should be sealed immediately.

Too much stress can not be laid upon the necessity of keeping the temperature of the sirup running into the cans about 185° F. Strict attention to this point will prevent subsequent fermentation. The density of the sirup in the vat is determined easily by means of the saccharometer by filling an elongated cylindrical cup with the hot sirup, in which the spindle floats until it becomes steady, then reading the scale division at the surface of the liquid.

4. *Labeling and crating.*—To promote the sale of the sirup the cans should be labeled neatly and attractively, for a well labeled can will sell more readily than an unlabeled one. A canning plant turning out a high-grade product should choose a brand for its sirup and stick to it. This is essential if any advertising is to be done or if a reputation is to be built up for the sirup of a locality, since the satisfied purchaser is enabled by the name or brand or design on the label to get another can of the same product.

A label bearing a registered name or trade-mark will prevent imitations and the substitution of goods of inferior quality. If a locality is proud of its quality of sirup, it should have its distinctive labels, so that all who use it may purchase it repeatedly and tell their friends. The process of labeling is simple and adds little to the cost of the sirup. For the larger plants machines may be obtained which rapidly and efficiently attach the labels to the cans. In smaller factories labeling by hand is not difficult, as an operator becomes surprisingly rapid after a little practice.

Before the sirup can be sold in large lots to wholesale grocers and other dealers it is necessary to crate it or put the cans in packages of convenient size. These crates or boxes, standard sizes holding 6 No. 10 cans, 12 No. 5 cans, or 24 of the No. 2½-size cans, are made of wood or fiber board. Those of wood come in the form of strips and must be nailed together, while the fiber-board boxes require a little gluing or pasting to make them ready for use. These packages furnish a neat, convenient, and safe means of handling sirup if large amounts of it are involved or it is to be shipped any distance.

COST OF CANNING SIRUP.

Only a general idea of the cost of canning sirup can be given. The men engaged in this business naturally do not want their cost data made public, so the only material at hand on which to figure this cost is that obtained in operating a small sirup-canning plant a short period, during which time all the troubles incidental to the first operation of a new plant developed. It is believed, however, from the experience thus gained that with the force as enumerated in Table 5, a plant can be operated with a capacity of 1,200 to 1,500 gallons per day. This rough estimate includes the process of receiving and canning the sirup, labeling, crating, and shipping not being considered. The figures given for hire of the operators are, necessarily, guesswork. They vary as labor conditions in the sirup-producing sections change.

TABLE 5.—*Cost per day of canning sirup.*

Superintendent	\$5
Fireman (who can assist in other work)	3
Canner	3
Helpers, two at \$2	4
Can sealer	3
Fuel	5
Total	23

Figuring that this force could handle 1,200 to 1,500 gallons per day, the cost of actual canning in round numbers would be between $1\frac{1}{2}$ and 2 cents per gallon. As there is a difference of about 3 cents each in the price of empty cans when bought wholesale in car-load lots and when purchased by individual farmers in small lots from retail stores, the saving in the price of cans will more than pay the expenses of the actual canning operations.

The price of labels as quoted recently by a large house handling canning equipment was \$5 per thousand for No. 5 cans and \$6.50 per thousand for No. 10 cans. Thus, the cost of labels would be slightly in excess of $\frac{1}{2}$ cent per can. As wooden crates holding six No. 10 cans cost from 15 cents to 25 cents each under prevailing market conditions and corrugated paper boxes cost about the same, the cost of crates would be from $2\frac{1}{2}$ cents to 4 cents per gallon of sirup.

It has been estimated that one girl is able to label 1,200 to 1,500 No. 10 cans per day; hence the cost of labeling should not be more than one-fourth cent per can. In a plant of this size three men should handle all the work of nailing crates, crating the cans, and stacking the crates ready for shipment. At an estimated cost of \$2.50 each per day, the cost of this portion of the operation of a sirup-canning plant would amount to \$7.50, or slightly more than $\frac{1}{2}$ cent per can.

An estimate of the total cost of canning sirup per 100 gallons is summed up in Table 6.

TABLE 6.—*Cost of canning 100 gallons of sirup.*

Management, canning operations, and fuel	\$2.00
Labeling .....	.25
Crating and stacking .....	.60
Labels .....	.65
Crates	2.00
Cans	12.50
Total	18.00

These estimates are made on the basis of canning sirup in No. 10 cans. The cost per gallon of canning sirup in the smaller-sized cans is appreciably more, but as these smaller sizes can be sold for a price that is relatively higher than that obtained for the larger sizes, the higher cost is thus absorbed.

SUMMARY.

At present the cane-sirup industry is handicapped by a lack of uniformity in the sirup offered for sale by the individual farmer. This condition may be remedied by the adoption of new and improved methods of manufacture and by cooperative canning. By means of a cooperative canning plant, the farmers in any sugar-cane-producing region will be able to secure uniformity in their sirup. It is also more economical for farmers to market their sirup collectively. This practice not only increases the sale of sirup, but also permits each farmer to devote more time to the production of other crops, thus deriving the maximum profit from his farm.



STATISTICAL DATA COMPILED AND
PUBLISHED BY THE BUREAU OF
CROP ESTIMATES

1863-1920

PART I. Publications of the Bureau of Crop Estimates

PART II. Subjects Included in the Reports and Records
of the Bureau of Crop Estimates



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 150

Contribution from the Bureau of Crop Estimates
LEON M. ESTABROOK, Chief

Washington, D. C.

January, 1921

FOREWORD.

The Bureau of Crop Estimates (Bureau of Statistics) has collected and compiled data relating to agriculture since its organization as a statistical division in the Patent Office in 1840, and has published such data in various forms since its transfer to the Department of Agriculture in 1862. Much of this material is of permanent value, but is not readily available to the public because the current publications of the bureau are not indexed and many of the earlier publications are out of print and can be found only in reference libraries.

In order that the public, especially research workers, statisticians, economists, students, and business men, may know what statistical material is available in the publications of the bureau, a complete list of "Publications of the Bureau of Crop Estimates" is presented herein, with serial number, title, author's name, and year published. (See Part I.)

For convenience of reference there is also presented a list of "Subjects Included in the Reports and Records of the Bureau of Crop Estimates, 1863-1920," arranged alphabetically by subjects, showing the kinds of information available for each subject, dates available, and page references to the Monthly Crop Reporter in which published, or number of office record of unpublished material. (See Part II.)

It is believed that the employees of the Bureau of Crop Estimates, research workers in other bureaus of the Federal Government, and in State agricultural colleges and experiment stations, as well as many private persons interested in the statistics of agriculture, will find these lists convenient and helpful in their work.

LEON M. ESTABROOK,
Chief of Bureau.

PART I.

PUBLICATIONS OF THE BUREAU OF CROP ESTIMATES, BEGINNING WITH 1863.

Annual Reports.

Report of Agricultural Statistics. Annual. 1863-1864.

Report of Statistician. Annual. 1865 to date.

General Publications.

Agricultural statistics. American centennial album of agricultural statistics, including maps, charts, diagrams, illustrations of industrial colleges. J. R. Dodge. 1876.

Cereals. Production and distribution of cereals of United States. J. R. Dodge. 1879. [Extract from report of Joseph Nimmo, jr., chief of Bureau of Statistics, Treasury Department, on internal commerce of United States, published Dec. 1, 1879.]

Crop correspondents. Manual of instructions to crop correspondents. Henry A. Robinson. 1895.

Same, revised and corrected. 1896.

Graphics. Album of agricultural graphics of United States. J. R. Dodge. 1890.

Same; by J. R. Dodge. 1891.

Industrial colleges: The nature of education to be given in them; their several kinds of instruction considered. Lewis Bollman. 1864.

Publications. [Letter relating to publications.] Henry A. Robinson. July 15, 1895. (Circ.)

Statistics. Album of agricultural statistics of United States. J. R. Dodge. 1889.

Same; by J. R. Dodge. 1891.

Bulletins. [Nos. 1 to 8 of this series were known as Reports; Nos. 9 to 103, inclusive, were Bulletins.]

No. 1. Report on flax, hemp, ramie, and jute. Charles Richards Dodge. 1890.

No. 2. Report on agriculture of South America. Almont Barnes. 1892.

No. 3. Cooperative Credit Associations in certain European countries. Edward T. Peters. 1892.

No. 4. Wages of farm labor in United States, from 1866 to 1892. 1892.

No. 5. Production and distribution of principal agricultural products of world. 1893.

No. 6. Rice: Its cultivation, production, and distribution in United States and foreign countries. Amory Austin. 1893.

No. 7. An agricultural survey of Wyoming. John W. Hoyt. 1893.

No. 8. Recent features of our foreign trade. Edward T. Peters. 1894.

No. 9. Production and price of cotton for 100 years. James L. Watkins. 1895.

Cotton and currency. 1895. (Separate.)

Bulletins—Continued.

- No. 10. Railway charges for transportation of wool. 1896.
- No. 11. Number and value of farm animals of United States, and animal products, 1880-1896. 1896.
- No. 12. Freight charges for ocean transportation of products of agriculture, Oct. 1, 1895-Oct. 1, 1896. 1896.
- No. 13. Fertilizer industry; review of statistics of production and consumption. John Hyde. 1898.
- No. 14. Of what service are statistics to the farmer? John Hyde. 1898.
- No. 15. Changes in rates of charge for railway and other transportation services. H. T. Newcomb. 1898.
Same, revised, 1901.
- No. 16. Cost of cotton production. James L. Watkins. 1899.
- No. 17. Cotton crop of 1898-99. James L. Watkins. 1900.
- No. 18. Course of prices of farm implements and machinery for series of years. George K. Holmes. 1901.
- No. 19. Cotton crop of 1899-1900. James L. Watkins. 1901.
- No. 20. Wheat growing and general agricultural conditions in Pacific coast region of United States. Edwin S. Holmes, jr. 1901.
- No. 21. Rates of charge for transporting garden truck, with notes on growth of industry. Edward G. Ward, jr., and Edwin S. Holmes, jr. 1901.
- No. 22. Wages of farm labor in United States; result of eleven statistical investigations, 1866-1898. 1901.
- No. 23. Statistics on fruit industry of California. Edwin S. Holmes, jr. 1901.
- No. 24. Relations of population and food products in the United States. James H. Blodgett. 1903.
- No. 25. Milk transportation: Freight rates to the largest fifteen cities in the United States. Edward G. Ward, jr. 1903.
- No. 26. Wages of farm labor in the United States. Results of twelve statistical investigations, 1866-1902. James H. Blodgett. 1903.
- No. 27. Wheat production and farm life in Argentina. Frank W. Bicknell. 1904.
- No. 28. The commercial cotton crops of 1900-1901, 1901-1902, and 1902-1903. James L. Watkins. 1904.
- No. 29. Methods and routes for exporting farm products. Edward G. Ward, jr. 1904.
- No. 30. International sugar situation. Frank R. Rutter. 1904.
- No. 31. Imports of farm and forest products, 1901-1903, by countries from which consigned. 1905.
- No. 32. Exports of farm and forest products, 1901-1903, by countries to which consigned. 1905.
- No. 33. Trade with noncontiguous possessions in farm and forest products, 1901-1903. 1905.
- No. 34. The commercial cotton crop of 1903-4. James L. Watkins. 1905.
- No. 35. Imports of farm and forest products, 1902-1904, by countries from which consigned. 1905.
- No. 36. Exports of Farm and Forest Products, 1902-1904, by countries to which consigned. 1905.
- No. 37. Trade with noncontiguous possessions in farm and forest products, 1902-1904. 1905.
- No. 38. Crop export movement and port facilities on the Atlantic and Gulf coasts. Frank Andrews. 1905.

Bulletins—Continued.

- No. 39. Meat in foreign markets, tariffs of fourteen importing nations, and countries of surplus. 1906.
- No. 40. Meat animals and packing-house products imported into eleven principal countries, 1895-1904. 1906.
- No. 41. Norway, Sweden, and Russia as markets for packing-house products. Imports from principal countries, 1895-1904. 1906.
- No. 42. Russia's wheat surplus; conditions under which it is produced. I. M. Rubinow. 1906.
- No. 43. Changes in farm values, 1900-1905. George K. Holmes. 1906.
- No. 44. Local conditions as affecting farm values, 1900-1905. George K. Holmes. 1906.
- No. 45. Imports of farm and forest products, 1903-1905, by countries from which consigned. 1906.
- No. 46. Exports of farm and forest products, 1903-1905, by countries to which consigned. 1906.
- No. 47. Trade with noncontiguous possessions in farm and forest products, 1903-1905. 1906.
- No. 48. The cost of producing farm products. Willet M. Hays and Edward C. Parker. 1906.
- No. 49. Costs of hauling crops from farms to shipping points. Frank Andrews. 1907.
- No. 50. Hops in principal countries: Their supply, foreign trade, and consumption, with statistics of beer brewing. Eugene Merritt. 1907.
- No. 51. Foreign trade of the United States in forest products, 1851-1908. G. K. Holmes. 1909.
- No. 52. Imports of farm and forest products, 1904-1906, by countries from which consigned. 1907.
- No. 53. Exports of farm and forest products, 1904-1906, by countries to which consigned. 1907.
- No. 54. Trade with noncontiguous possessions in farm and forest products, 1904-1906. 1907.
- No. 55. Meat supply and surplus, with consideration of consumption and exports. George K. Holmes. 1907.
- No. 56. Corn crops of the United States, 1866-1906. Charles C. Clark. 1907.
- No. 57. Wheat crops of the United States, 1866-1906. Charles C. Clark. 1907. Revised, 1908.
- No. 58. Oat crops of the United States, 1866-1906. Charles C. Clark. 1907.
- No. 59. Barley crops of the United States, 1866-1906. Charles C. Clark. 1907.
- No. 60. Rye crops of the United States, 1866-1906. Charles C. Clark. 1908.
- No. 61. Buckwheat crops of the United States, 1866-1906. Charles C. Clark. 1908.
- No. 62. Potato crops of the United States, 1866-1906. Charles C. Clark. 1908.
- No. 63. Hay crops of the United States, 1866-1906. Charles C. Clark. 1908.
- No. 64. Number and farm value of farm animals in the United States, 1867-1907. Charles C. Clark. 1908.
- No. 65. Russia's wheat trade. I. M. Rubinow. 1908.

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- No. 66. Russia's wheat and wheat flour in European markets. I. M. Rubinow. 1908.
- No. 67. Ocean freight rates and the conditions affecting them. Frank Andrews. 1907.
- No. 68. Cereal production of Europe. Frank R. Rutter. 1908.
- No. 69. European grain trade. Frank R. Rutter. 1908.
- No. 70. Imports of farm and forest products, 1905-1907, by countries from which consigned. 1909.
- No. 71. Exports of farm and forest products, 1905-1907, by countries to which consigned. 1908.
- No. 72. Agricultural imports of the Netherlands. 1909.
- No. 73. The cost of producing Minnesota farm products, 1902-1907. Edward C. Parker and Thomas P. Cooper. 1909.
- No. 74. Imports of farm products into the United States, 1851-1908. 1910.
- No. 75. Exports of farm products from the United States, 1851-1908. 1910.
- No. 76. Imports of farm and forest products, 1906-1908, by countries from which consigned. 1909.
- No. 77. Exports of farm and forest products, 1906-1908, by countries to which consigned. 1910.
- No. 78. Agricultural Graphics. United States and world crops and live stock. Middleton Smith. 1910.
- No. 79. Coffee. Production, trade, and consumption, by countries. Harry C. Graham. 1912.
- No. 80. Not issued.
- No. 81. Grain movement in the Great Lakes Region. Frank Andrews. 1911.
- No. 82. Imports of farm and forest products, 1907-1909, by countries from which consigned. 1910.
- No. 83. Exports of farm and forest products, 1907-1909, by countries to which consigned. 1910.
- No. 84. Russian cereal crops. Area and production by Governments and Provinces. Edward T. Peters. 1911.
- No. 85. Seed time and harvest: Cereals, flax, cotton, and tobacco. James R. Covert. 1912.
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- No. 87. Not issued.
- No. 88. The cost of producing Minnesota dairy products, 1904-1909. Thomas P. Cooper. 1911.
- No. 89. Marketing grain and live stock in the Pacific coast region. Frank Andrews. 1911.
- No. 90. Imports of farm and forest products, 1908-1910, by countries from which consigned. 1911.
- No. 91. Exports of farm and forest products, 1908-1910, by countries to which consigned. 1911.
- No. 92. Not issued.
- No. 93. Cold-storage business features. George K. Holmes. 1913.
- No. 94. Supply of farm labor. George K. Holmes. 1912.
- No. 95. Imports of farm and forest products, 1909-1911, by countries from which consigned. 1912.
- No. 96. Exports of farm and forest products, 1909-1911, by countries to which consigned. 1912.
- No. 97. Not issued.

Bulletins—Continued.

- No. 98. Not issued.
- No. 99. Wages of farm labor. George K. Holmes. 1912.
- No. 100. Railroads and farming. Some influences affecting the progress of agriculture. Frank Andrews. 1912.
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- No. 102. List of agricultural fairs and exhibitions in the United States. George K. Holmes. 1913.
- No. 103. International trade in farm and forest products, 1901–1910. Eugene Merritt. 1913.

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- No. 2. The wheat crop of the world. Henry A. Robinson. 1896.
- No. 3. The farmers' interest in finance. Henry Farquhar. 1896.
- No. 4. The cotton crop of 1895. Henry A. Robinson. 1897.
- No. 5. Local taxation as affecting farms. Henry A. Robinson. 1897.
- No. 6. Cereal crops of 1896. Henry A. Robinson. 1897.
- No. 7. The cotton crop of 1896. Henry A. Robinson. 1897.
- No. 8. The cotton crop of 1896–1897. John Hyde. 1898.
- No. 9. The cotton crop of 1897–1898. James L. Watkins. 1898.
- No. 10. Brazos River, Tex., flood of June and July, 1899, and its effects upon the agriculture of the submerged region. E. S. Holmes, jr. 1899.
- No. 11. The world's grain crops in 1899. John Hyde. 1899.
- No. 12. Changes in railroad freight classifications. Edward G. Ward, jr. 1900.
- No. 13. List of free employment agencies for the use of farmers. 1900.
- No. 14. Estimates of Russian crops. E. T. Peters. 1901.
- No. 15. Foreign trade in farm and forest products, 1903. George K. Holmes. 1904.
- No. 16. Foreign trade in farm and forest products, 1904. George K. Holmes. 1905.
- No. 17. Government crop reports: Their value, scope, and preparation, Charles C. Clark. 1908. Revised, 1911, 1915, 1918.
- No. 18. Tobacco districts and types. J. P. Killebrew. 1909.
- No. 19. Foreign crops, May, 1911. Charles M. Daugherty. 1911.
- No. 20. Foreign crops, June, 1911. Charles M. Daugherty. 1911.
- No. 21. Foreign crops, July, 1911. Charles M. Daugherty. 1911.
- No. 22. Tobacco report, July 1, 1911. J. P. Killebrew. 1911.
- No. 23. Foreign crops, August, 1911. Charles M. Daugherty. 1911.
- No. 24. Foreign crops, September, 1911. Charles M. Daugherty. 1911.
- No. 25. Foreign crops, October, 1911. Charles M. Daugherty. 1911.
- No. 26. Foreign crops, November–December, 1911. Charles M. Daugherty. 1911.
- No. 27. Tobacco crops, 1911, by types and districts. J. P. Killebrew. 1912.
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- No. 29. Foreign-crops summary. Area and production of cereals. 1907–1911, and of flaxseed, 1908–1910, by countries. Charles M. Daugherty. 1912.
- No. 30. Foreign crops, March, 1912. (Argentina.) Charles M. Daugherty. 1912.

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- No. 31. Annual and average production of and international trade in important agricultural products, by countries. Royal T. McKenna. 1912.
- No. 32. Cotton crops of the United States, 1790–1911. George K. Holmes. 1912.
- No. 33. Tobacco crop of the United States, 1612–1911. George K. Holmes. 1912.
- No. 34. Rice crop of the United States, 1712–1911. George K. Holmes. 1912.
- No. 35. Hop crop of the United States, 1790–1911. George K. Holmes. 1912.
- No. 36. Foreign crops, April, 1912. (British India.) Harry C. Graham. 1912.
- No. 37. Foreign crops, May–June, 1912. Charles M. Daugherty. 1912.
- No. 38. Tobacco report, July 1, 1912. J. P. Killebrew. 1912.
- No. 39. Foreign crops, July, 1912. Charles M. Daugherty. 1912.
- No. 40. Foreign crops, August–September, 1912. Charles M. Daugherty. 1912.
- No. 41. Foreign crops, October, 1912. Charles M. Daugherty. 1912.
- No. 42. Foreign crops, November, 1912. Charles M. Daugherty. 1912.
- No. 43. Tobacco crop, 1912, by types and districts. J. P. Killebrew. 1913.
- No. 44. Foreign crops, December, 1912. Charles M. Daugherty. 1913.
- No. 45. Foreign crops: January. Summary by countries of the area and production of cereals, 1908–1912, and of flaxseed, 1909–1911. Charles M. Daugherty. 1913.
- No. 46. Foreign crops, February 1913. Charles M. Daugherty. 1913.
- No. 47. Foreign crops, March–April, 1913. Charles M. Daugherty. 1913.
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- Circular 17, revised. Government crop reports: Their value, scope, and preparation. Leon M. Estabrook. 1915.
- Circular 17, revised. Government crop reports: Sources of information, methods of preparation and checking, demonstrated accuracy. Leon M. Estabrook. 1918.

Crop Circulars.

[Crop circulars took the place of the crop reports, new series, issued monthly (except January), and consisted of the information contained in the telegraphic reports of the 10th of each month.]

Issued monthly, May–November, 1898 and 1899; and April, 1900. [Discontinued.]

Crop Reporter.

Two-column quarto, published monthly, May, 1899, to June, 1913, inclusive.

Agricultural Outlook.

Similar information to that formerly published in the Crop Reporter was published in Farmers' Bulletins entitled "Agricultural Outlook"—in 19 monthly publications from September 11, 1913, to April 23, 1915. [Farmers' Bulletin Nos. 558, 560, 563, 570, 575, 581, 584, 590, 596, 604, 611, 615, 620, 629, 641, 645, 651, 665, 672.]

Monthly Crop Report.

May, 1915, to January, 1919, inclusive.

Monthly Crop Reporter.

February, 1919, and subsequently (to date).

Statistical Reports.

Contains reports on condition of crops, and special subjects of interest to farmers. Issued as "Monthly" or "Bi-monthly Report" of Department from May, 1863, to December, 1876, when the series was discontinued and the issue of the statistical matter was transferred to the series of "Special reports" and there appeared under various numbers, not always consecutive, from January, 1877, to September, 1883. Another change was made in October, 1883, when "New Series, Report No. 1," appeared containing the crop statistics. This last series was continued, consecutively numbered, up to No. 155, December, 1897. No. 156 was issued April 20, 1899. From May, 1898, to April, 1900, the statistics were issued in a "Crop circular." Beginning with May, 1900, they were merged into the "Crop Reporter." Statistical reports separate. [Reprinted from new series, report No. 115 of statistician 1894.]

Monthly Crop Synopsis.

Synopsis of the monthly statistical reports issued as a four-page leaflet soon after the 10th of each month from March, 1890, to May, 1896, inclusive, and bearing a number identical with that of the report which it summarizes. [Discontinued.]

Separate Reprints from the Department of Agriculture Yearbook. [Known as "Yearbook Separates."]

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- No. 121. Of what service are statistics to the farmer? John Hyde. 1898.
- No. 122. Agricultural production and prices, 1897.
- No. 154. The public domain of the United States. Max West. 1899.
- No. 155. Keeping goats for profit. Almont Barnes. 1899.
- No. 156. Agricultural statistics relating to grain, cotton, sugar, animals, etc., in the United States. 1899.
- No. 164. Statistical matter relating to principal crops and farm animals, transportation rates, etc., in the United States, 1899. 1900.
- No. 179. Progress of agriculture in the United States. George K. Holmes. 1900.
- No. 200. Statistical matter relating to principal crops and farm animals, transportation rates, etc., in the United States, 1900. 1901.
- No. 209. Influence of rye on the price of wheat. Edward T. Peters. 1901.
- No. 234. The future demand for American cotton. J. L. Watkins. 1902.
- No. 239. The cottonseed industry. Charles M. Daugherty. 1902.
- No. 256. Wheat ports of the Pacific coast. Edwin S. Holmes, jr. 1902.
- No. 258. Statistical matter relating to principal crops and farm animals, freight rates, exports, etc., in the United States, 1901.
- No. 282. Flaxseed production, commerce, and manufacture in the United States. Charles M. Daugherty. 1903.
- No. 289. Practices in crop rotation. George K. Holmes. 1903.
- No. 298. Statistical matter relating to principal crops and farm animals, freight rates, exports, etc., of the United States, 1902. 1903.
- No. 304. The Nation's farm surplus. George K. Holmes. 1904.
- No. 308. Consumption of cotton in the cotton States. J. L. Watkins. 1904.
- No. 319. The industry in oil seeds. Charles M. Daugherty. 1904.

Separate Reprints from the Department of Agriculture Yearbook—Continued.

- No. 334. Statistical matter relating to principal crops and farm animals, freight rates, exports, etc., of the United States, 1903. 1904.
- No. 347. The castor oil industry. Charles M. Daugherty. 1905.
- No. 357. Consumers' fancies. George K. Holmes. 1905.
- No. 370. Statistical matter relating to principal crops and farm animals, freight rates, exports, etc., of the United States, 1904. 1905.
- No. 400. Causes affecting farm values. George K. Holmes. 1906.
- No. 404. Statistical matter relating to principal crops and farm animals, freight rates, exports, etc., of the United States, 1905. 1906.
- No. 421. Foreign restrictions on American meat. Frank R. Rutter. 1907.
- No. 430. Freight costs and market values. Frank Andrews. 1907.
- No. 436. Agricultural statistics, 1906. 1907.
- No. 449. Traffic on Chesapeake Bay and Tennessee River. Frank Andrews. 1908.
- No. 465. Agricultural statistics, 1907. 1908.
- No. 477. Cost and methods of transporting meat animals. Frank Andrews. 1909.
- No. 498. Agricultural statistics, 1908. 1909.
- No. 502. Methods and cost of marketing. Frank Andrews. 1910.
- No. 524. Agricultural statistics, 1909. 1910.
- No. 528. Supply and wages of farm labor. George K. Holmes. 1911.
- No. 553. Agricultural statistics, 1910. 1911.
- No. 554. Live stock and miscellaneous agricultural statistics, 1910. 1911.
- No. 555. Statistics of principal crops, 1910. 1911.
- No. 558. The reduction of waste in marketing. Frank Andrews. 1912.
- No. 587. Statistics of principal crops, 1911. 1912.
- No. 588. Live stock and miscellaneous agricultural statistics, 1911.
- No. 614. Statistics of principal crops, 1912. 1913.
- No. 615. Live stock and miscellaneous agricultural statistics 1912. 1913.
- No. 630. Statistics of principal crops, 1913. 1913.
- No. 631. Live-stock and miscellaneous agricultural statistics, 1913.
- No. 641. Movement from city and town to farms. G. K. Holmes. 1914.
- No. 654. Statistics of grain crops, 1914. 1914.
- No. 655. Statistics of crops other than grain crops, 1914. 1914.
- No. 656. Live stock. 1914, and census data. 1914.
- No. 657. Imports and exports of agricultural products. 1914.
- No. 681. A graphic summary of American agriculture. 1915.
- No. 682. Statistics of grain crops, 1915. 1915.
- No. 683. Statistics of crops other than grain crops, 1915. 1915.
- No. 684. Live stock, 1915, and miscellaneous data. 1915.
- No. 685. Imports and exports of agricultural products. 1915.
- No. 702. Development and localization of truck crops in the United States. 1916.
- No. 713. A graphic summary of world agriculture. 1916.
- No. 719. Statistics of grain crops, 1916. 1916.
- No. 720. Statistics of crops other than grain crops, 1916. 1916.
- No. 721. Live stock, 1916, and miscellaneous data. 1916.
- No. 722. Imports and exports of agricultural products. 1916.
- No. 741. Hides and skins: Production, foreign trade, supply, and consumption. George K. Holmes. 1917.
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Separate Reprints from the Department of Agriculture Yearbook—Continued.

- No. 759. Statistics of grain crops, 1917. 1917.
 No. 760. Statistics of crops other than grain crops, 1917. 1917.
 No. 761. Live stock, 1917, and miscellaneous data. 1917.
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 No. 792. Statistics of crops other than grain crops, 1918. 1918.
 No. 793. Live stock, 1918. 1918.
 No. 794. Imports and exports of agricultural products. 1918.
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- No. 66. Statistics of sugar in the United States and its insular possessions, 1881–1912. Frank Andrews. 1914.
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 No. 177. The production and consumption of dairy products. Eugene Merritt. 1915.
 No. 296. Our foreign trade in farm and forest products. Perry Elliott. 1915.
 No. 325. Honeybees. Samuel A. Jones. 1915.
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 No. 483. Statistics of fruits in principal countries. H. D. Ruddiman. 1917.
 No. 485. Apples: Production estimates and important commercial districts and varieties. H. P. Gould; Frank Andrews. 1917.
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 No. 696. Geographical phases of farm prices: Corn. L. B. Zapoléon. 1918.
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 No. 806. Peaches: Production estimates and important commercial districts and varieties. H. P. Gould; Frank Andrews. 1919.
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October 8, 1917, to December 12, 1919. [Discontinued.]

Special Commercial Peach Crop Report. (Issued monthly.)

April 13, 1918, to April 12, 1920. [Discontinued.]

Special Commercial Pear Crop Report. (Issued monthly.)

July 9, 1919, to November 8, 1919. [Discontinued.]

Special Commercial Potato Crop Report. (Issued monthly, but twice a month for September and October.)

August 16, 1919, to December 17, 1919. [Discontinued.]

Weekly Truck Crop News.

December 13, 1917, to January 26, 1920.

Weekly Crop and Market Review of Fruits and Vegetables.

[Bureau of Crop Estimates and Bureau of Markets cooperating.] February 3, 1920, to April 20, 1920.

[Bureau of Markets.] April 27, 1920, and subsequently to date.

Weekly Crop Notes by Field Agents.

Week ending May 18, 1918, and subsequently to date.

Foreign Crop and Live Stock Reports. (Issued twice a month.)

March 13, 1919, and subsequently to date.

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Field agent's handbook of agricultural statistics. Leon M. Estabrook. 1914.
Crop estimates, 1910-1919. Leon M. Estabrook. 1920.

PUBLICATIONS OF THE DIVISION OF FOREIGN MARKETS.

(Which became part of the Bureau of Statistics in 1903.)

Bulletins.

No. 1. Great Britain and Ireland.

No. 2. The German Empire.

No. 3. France.

No. 4. Canada.

No. 5. Netherlands.

No. 6. Belgium.

No. 7. Norway.

No. 8. Sweden.

No. 9. Trade of Denmark.

No. 10. Our foreign trade in agricultural products during the five fiscal years, 1893-1897.

No. 11. Spain's foreign trade.

No. 12. Our trade with Spain, 1888-1897.

No. 13. Trade of Puerto Rico.

No. 14. Trade of the Philippine Islands.

No. 15. Our foreign trade in agricultural products, 1894-1898.

No. 16. Distribution of the agricultural exports of the United States, 1894-1898.

No. 17. Sources of the agricultural imports of the United States, 1894-1898.

No. 18. Our trade with Japan, China, and Hongkong, 1889-1899.

No. 19. Our foreign trade in agricultural products, 1890-1899.

No. 20. Agricultural exports of the United States, by countries, 1895-1899.

No. 21. Agricultural imports of the United States, by countries, 1895-1899.

No. 22. Our trade with Scandinavia, 1890-1900.

No. 23. Our foreign trade in agricultural products, 1891-1900.

Bulletins—Continued.

- No. 24. Sources of the agricultural imports of the United States, 1896-1900.
- No. 25. Distribution of the agricultural exports of the United States, 1896-1900.
- No. 26. Agricultural imports of the United Kingdom, 1896-1900.
- No. 27. Our foreign trade in agricultural products, 1892-1901.
- No. 28. Sources of the agricultural imports of the United States, 1897-1901.
- No. 29. Distribution of the agricultural exports of the United States, 1897-1901.
- No. 30. Agricultural imports of Germany, 1897-1901.
- No. 31. Sources of the agricultural imports of the United States, 1898-1902.
- No. 32. Distribution of the agricultural exports of the United States, 1898-1902.
- No. 33. Foreign trade of the United States in forest products, 1902.
- No. 34. American grain and flour in the British market.
- No. 35. Foreign import tariffs on meat and meat products, 1903.
- No. 36. Foreign import tariffs on fruits and nuts, 1903.
- No. 37. Foreign import tariffs on grain and grain products, 1903.

Circulars.

- No. 1. Peaches and other fruits in England.
- No. 2. American dried apples in the German Empire.
- No. 3. Imports and exports for 1893 and 1894.
- No. 4. An example for American farmers and dairymen.
- No. 5. The treaty of Shimonoseki between China and Japan of April 17, 1895, and our possibilities of trade with those countries.
- No. 6. Imports and exports for 1893, 1894, and 1895.
- No. 7. Extension of markets for American feedstuffs.
- No. 8. The Manchester district of England as a market for American products.
- No. 9. Imports and exports for 1893, 1894, 1895, and 1896.
- No. 10. Course of wheat production and exportation in the United States, Canada, Argentina, Uruguay, Russia, and British India from 1880 to 1896.
- No. 11. Agricultural products imported and exported by the United States in the years ended June 30, 1892, to 1896, inclusive.
- No. 12. Sources of the principal agricultural imports of the United States during the five years ended June 30, 1896.
- No. 13. Distribution of the principal agricultural exports of the United States during the five years ended June 30, 1896.
- No. 14. Hamburg as a market for American products.
- No. 15. Exports of cotton from Egypt.
- No. 16. Our trade with Cuba from 1887 to 1897.
- No. 17. United States wheat for Eastern Asia.
- No. 18. Hawaiian commerce from 1887 to 1897.
- No. 19. Austria-Hungary as a factor in the world's grain trade; recent use of American wheat in that country.
- No. 20. Agricultural imports and exports, 1893-1897.
- No. 21. Agricultural imports and exports, 1894-1898.
- No. 22. Agricultural imports and exports, 1895-1899.
- No. 23. Agricultural imports and exports, 1896-1900.
- No. 24. Agricultural imports and exports, 1897-1901.
- No. 25. Our foreign trade in agricultural products, 1902.
- No. 26. Belgium's foreign trade in agricultural products for 1902.

PART II.

SUBJECTS INCLUDED IN THE REPORTS AND RECORDS OF THE BUREAU OF CROP ESTIMATES, 1863-1920.

KEY TO REFERENCES.

Unless otherwise stated, the references to date and page of a publication are for the Monthly Crop Reporter (under various titles in different periods. See pp. 8 and 9.)

"Office table"=table on file in the Division of Crop Records.

"Truck Crop Division"=files of the truck crop section, Bureau Crop Estimates.

"Yearbook"=U. S. Department of Agriculture Yearbook, numbered.

Bulletins and circulars are here mentioned by number; for their titles and dates of publication see list of publications, on pages 3-13.

The regular statistical items in the Monthly Crop Reporter are usually summarized in the Yearbooks; hence for most of these regular items no separate references to the Yearbook are made in the following pages.

Acreage.

(For further details see each crop.)

Aggregate:

By States: 1919 and 1917, 1918, 1919; March, 1920, p. 25.

In United States: 1909-1918; September, 1918, p. 108; November, 1919, p. 116.

Acres per man: United States and Germany: January, 1913, p. 4.

Crops, by States:

Since 1866, barley, buckwheat, cotton, hay, oats, potatoes, rye, tobacco, wheat (all).

Since 1890, spring and winter wheat separately.

Since 1899, sweet potatoes.

Since 1901, sugar beets.

Since 1902, flaxseed.

Since 1904, rice.

Since 1910, sorghum for sirup.

Since 1912, alfalfa, clover, and wild hay.

Since 1914, beans (5 States), cranberries (3 States).

Since 1915, broom corn (5 States), hemp (2 States), hops (4 States), grain, sorghums (6 States), truck crops.

Since 1916, peanuts, cowpeas.

Since 1917, soy beans, velvet beans.

Since 1918, sugar cane.

For details see under each crop in this index.

Acreage—Continued.

Crops in foreign countries:

Barley, beans, corn, cotton, flax, oats, hops, peas, potatoes, rice, rye, sugar beets, tobacco, wheat: Yearbooks. Dates and other details are given under each crop in this index. All countries and years reported, in original and United States units: files of Division of Crop Records. Current data: in Foreign Crop and Live Stock Reports, semi-monthly since March, 1918.

Alfalfa (Hay).

Acreage:

Per cent of all hay, by States, 1918. January, 1919, p. 2.

Per cent of, grown in each State. June, 1908, p. 43.

In Kansas, 1909. April, 1910, p. 32.

In Nebraska, 1908-9. April, 1910, p. 30.

Condition: By States, since 1906. In June and August.

Crop:

In certain States, 1900 to 1908. Office tables 7, A and B.

In Oklahoma, 1907. March, 1909, p. 24.

Prices:

To producers, by States; monthly since May, 1914. Office table 293-51.

Wholesale, at St. Louis; monthly, beginning 1898. Office table 93.

Production, by States:

Since 1915. Usually in December; preliminary in September since 1918.

Per cent of full crop, by States. Since 1906; usually in September.

Increase of, in certain States. January, 1909, p. 8.

In Nebraska, 1908-9. April, 1910, p. 30.

Seed used per acre, in United States. June, 1913, p. 48.

Yield per acre:

By States. Since 1918; usually in September.

In Nebraska. November, 1907, p. 88.

Alfalfa (Seed).

Adulteration. March, 1909, pp. 21-22; March, 1910, pp. 21-22.

Prices:

To producers, by States. Monthly since June, 1912. Office tables 293-55 and 293-66.

Paid by farmers, by States. Monthly since June, 1912.

Production: Per cent of full crop, by States. Since 1912; usually in October.

Yield per acre, by States. Since 1912; usually in October.

Apples.

Acreage: Commercial, regional distribution (map). Yearbook 1918, p. 370. Charts, United States:

Average yearly production of leading varieties of apples, 1909-1913.

Relative production of principal varieties of apples, 1909-1913.

Relative production of early and of late varieties of apples in 1915.

Quantity of apples produced by States, in June, July, August, September, October. Office table 286.

Commercial:

By States. Since October, 1917; monthly, July to November.

Production. Since 1917, in December.

Apple movement, 1912. May, 1913, p. 39.

Apples—Continued.

Condition, by States. Since 1866, in June, July, August, September, October, except 1879.

Crop of the United States, 1899-1916 (chart). April, 1917, p. 29.

Crop disposition and value, 1915 and 1916. April, 1917, p. 33; April, 1916, p. 35.

Carried on railroads and boat lines in United States. June 1-November 30, 1914; June, 1915, p. 4.

Estimate by varieties. September, 1916, p. 93.

Exports (barrels), 1852-1910; 5-year average, 1901 to date. Yearbook 1919, p. 701.

Number of trees of bearing age, by States. Since 1914, in November.

Percentage of late crop marketed. Since 1915, in November.

Price:

December 1, and total value, by States. Since 1910.

Monthly, 1st of month, per bushel and per barrel. Since 1916.

Monthly, 15th of month, per bushel. Since January, 1910.

Monthly, 15th of month, per barrel. Since October, 1913.

Production:

By States. Since 1889, in November.

Compared with average, United States. 1909, in November; also 10-year average.

Estimates and prices, discussions. 1913, in June.

Percentage of a full crop, by States. Since 1866, in November, except 1877-1881.

And exports, 1901-1915. October, 1916, p. 102.

In barrels, estimated by States and geographic divisions, 1889-1915. October, 1916, p. 103.

In Washington, 1916 and 1917. September, 1917, p. 81.

Relative, by principal varieties. Farmers' Bulletin No. 641, pp. 16, 17, 18, and 19; also Office table 263.

Quality: by States. Since 1909, in November.

Shipments, 1911. April, 1912, p. 31.

Shipped out of county, by States. Since 1914, in December.

Special commercial report of barreled and boxed, by States. August, 1918, p. 93.

Regional report. 1918 and 1919, in July and August.

Apricots (California).

Condition. Since 1911, in May, June, July, and August.

Production, percentage of a full crop. Since 1911, usually in September.

Asparagus.

Acreage, percentage of total. By States; October, 1906, p. 42.

Condition by States. Since April, 1915, twice a month during season (Truck Crop Division).

Damage by blight, by States. October, 1906, p. 42.

Production:

Compared with average United States. 1906 to 1912, usually in November.

Compared with full crop, by States. 1906 to 1912, usually in June.

Asses.

Number, world: Yearbook since 1905; office table 262.

Barley.

Acreage since 1866:

By States. Usually in June; revised in December.

Barley—Continued.

Foreign countries. 1917-1919, January, 1920, p. 3. Since 1905, Department Yearbooks.

Conditions. Since 1866, by States, June to September, inclusive.

Consumption:

By classes of live stock for United States. October, 1914, p. 8, August 1919, p. 77.

Monthly, on farms, in United States. June, 1919, p. 57.

Per capita of population, United States and some foreign countries. 1902-1911, October, 1918, p. 24.

Per capita of population, 1909-1913 and 1914-1918. Yearbook, 1919. Table 88.

Damage to crops, causes of, by States, since 1909. June, 1912, pp. 46 and 48.

Dates of sowing and harvesting in different countries. Office table No. 297-2.

Harvesting:

Per cent monthly, for United States. October, 1919, p. 104.

Methods of, by States. February, 1917, p. 14.

Planting dates of, by States. May, 1912, p. 35; Bu. Statistics Bul. 85.

Prices:

To producers, by States, on December 1, since 1866; monthly since January, 1908.

Wholesale; at 5 United States markets. Monthly since 1895; office table 294-3; also Department Yearbooks.

Production:

Since 1866, by States. Usually in October; revised in December.

Forecast from condition, by States. Since 1911, each month, June to September, inclusive.

In foreign countries. Usually once a year, or oftener, since 1891.

Cost of, by States, 1909. October, 1911, p. 80.

Quality. Since 1866, except in 1877-1881, 1885, 1890, 1891, 1893; by States; usually in October.

Shipments out of county where grown, by States. Since 1910, usually in March.

Seed used per acre:

In the United States. June, 1913, p. 48.

In foreign countries. April, 1915, p. 11.

Stocks on farms:

By States. Since 1910, March and August.

Relative stocks, January 1, 1917, and 1918. May, 1918, p. 52.

Supply and distribution, since 1910. March, 1920, p. 26.

Value on farms, by States. Since 1866, usually in December.

Weight per measured bushel, by States. Since 1910, usually in October.

Yield per acre:

Since 1866, by States. Usually in October; revised in December.

Annual changes in United States. Since 1866. January, 1919, p. 3.

Largest reported in United States. August, 1916, p. 76, and January, 1918, p. 2.

In nine foreign countries, since 1890. Office table No. 312-2; also Yearbooks.

Equivalent to 100 per cent (or normal) condition. Once a year since 1911.

Beans (Dry, Edible).**Acreage:**

By (5) States. Since 1914, usually in July; revised in December.

Abandoned in principal States, 1917. April, 1918, p. 39.

Commercial, by States. August, 1915, p. 37.

In principal States, by varieties. September, 1919, p. 87; April, 1918, p. 39; August, 1917, p. 70; also Yearbook 1918, table 287.

In foreign countries. Since 1906, usually once a year or oftener.

Condition, by States. Since 1909, usually in July, August, and September.

Crop:

In Michigan. 1902 to 1906, usually in December, March, or April.

In United States, by States, 1899. August, 1902, p. 6.

In certain States. December, 1901, p. 4; March, 1902, p. 3; April, 1902, p. 7; April, 1903, p. 2.

Discussion of United States crop. December, 1901, pp. 4-5.

Prices:

To producers. By (5) States, on December 1 since 1914; by States, monthly since January, 1910.

Wholesale at 3 United States markets. Office table 294-15.

Production:

By (5) States. Since 1914, usually in December.

By States, 1867-1918, office table 383.

By States and types, 1917. April, 1918, p. 39.

Forecast from condition by States. Since 1917, usually in July, August, September, and October.

Compared with average. Since 1910, usually in November or December.

Per cent of full crop, by States. Since 1906, usually in October or November.

In foreign countries. Since 1906, usually once a year or oftener.

Quality, commercial crop, by States. August, 1915, p. 37.

Seed used per acre in United States. June, 1913, p. 48.

Value on farms, by States. On December 1 since 1914.

Varieties:

Acreage or relative importance, by States. August, 1917, p. 70; April, 1918, p. 39; September, 1919, p. 87.

Commercial crop, by States. August, 1915, p. 37.

Yield per acre:

By principal States. April, 1918, p. 39.

Commercial crop, by States. August, 1915, p. 37.

Beans (Green or Snap)**Acreage:**

Contracted for by canneries, by States, 1916-17. August, 1917, p. 76.

For canning, by States. Since 1918, in June and October (Truck Crop Division).

Condition:

By States. Since April, 1915. Twice a month during season (Truck Crop Division).

Canning crop, by States. Since August, 1916, twice a month during season (Truck Crop Division).

Dates of planting and harvesting, by States. Office table 273-2.

Production, canning crop, by States. Since 1919, usually in October (Truck Crop Division).

Special Report, prices and value of canning crop, March 16, 1920. On file (Truck Crop Division).

Beans (Lima).

Acreage, per cent in each State. July, 1908, p. 45.

Condition, by States. Since 1907, June to September, inclusive.

Crop: In California. September, 1902, p. 5. (For recent years see Agriculture statistician's reports.)

Production:

Compared with average. 1909 to 1913, usually in November.

Compared with full crop, by States. 1907 to 1913, usually in October.

Per cent of full crop, in California. Since 1907, except 1915, usually in October.

By States, 1914. October, 1914, p. 26.

Yield per acre, by States, 1914. October, 1914, p. 26.

Bees.

Number of colonies, condition of bees, condition of nectar plants, May 1, 1914, compared with former year. Farmers' Bulletin 598, p. 17, and following in May.

See also "Honey."

Beets.

Condition, by States. Since April, 1915, usually twice a month during season. (Truck Crop Division.)

Seed used per acre, United States. June, 1913, p. 48.

Blackberries and Raspberries.

Condition, by States. Since 1906, in June and July.

Production:

By States, percentage of a full crop. Since 1906, in August.

Compared with average, United States. 1910, in November.

Blue Grass.

Condition: Seed crop, by States. Since 1906, June to August, inclusive.

Crops:

Of Kentucky. July, 1917, p. 60.

United States. July, 1902, p. 6.

Production, per cent of full crop, for seed, by States. Since 1906, usually in September.

Seed, adulteration. May, 1913, p. 37.

Broom Corn.**Acreage:**

Five States. Since 1915, in December.

In Kansas, 1909. May, 1910, p. 32.

In Argentina. February, 1919, p. 11.

Brooms and brushes industry, 1909 and 1914. Office table 361 (census data).

Condition, by States. Since 1906, monthly, July to September.

Consumption and surplus:

World. November, 1900, p. 5.

On Argentina. February, 1919, p. 11.

Crop:

United States, October, 1904, p. 38; November, 1905, p. 37; March, 1906, p. 102.

United States (commercial estimates), November, 1906, p. 50.

United States (commercial estimates), 1901-2. November, 1902, p. 8.

In Kansas and Oklahoma, 1906-7. December, 1907, p. 102, and February, 1909, p. 9; November, 1905, p. 62.

In Illinois. July, 1901, p. 2.

Broom Corn—Continued.

Prices to producers, by States. On December 1, since 1915; monthly since January, 1910. Office tables 266 and 293-56.

Production:

By States. Since 1915, usually in December.

Forecast from condition by States. Since 1918, in July, August, September.

Per cent of average crop in United States. November, 1912, p. 81.

Per cent of full crop, by States. Since 1906, usually in October.

In Kansas, 1909. May, 1910, p. 32.

In Argentina. February, 1919, p. 11.

Seed used per acre, in United States. June, 1913, p. 48.

Value on farms, by States. Since 1915, in December.

Yield per acre:

By States. Since 1911, usually in October; revised in December.

Per cent of average crop. November, 1912, p. 81.

Brussels Sprouts.

Condition, by States. Since April, 1915, usually twice a month during season (Truck Crop Division).

Buckwheat.

Acreage, by States. Since 1866, usually in August; revised in December.

Condition, by States. Since 1866 in October and 1867 in August and September.

Harvesting, dates of, for United States. October, 1919, p. 104.

Planting, dates of, by States. May, 1912, p. 35.

Prices to producers, by States. On December 1 since 1866; monthly since January, 1908.

Production:

By States. Since 1866, usually in November; revised in December.

Forecast from condition, by States. Since 1911 in August, September, October.

Quality, by States. Since 1882, except in 1883, 1890, 1892, usually in November.

Seed used per acre, United States. June, 1913, p. 48.

Stocks on farms, relative stocks; January 1, 1917 and 1918. May, 1918, p. 52.

Value on farms, by States. Since 1866, usually in December.

Yield per acre:

By States. Since 1866, usually in November; revised in December.

Changes in United States since 1866. January, 1919, p. 3.

Equivalent to 100 per cent (or normal) condition. Usually once a year since 1911.

Buffaloos.

Number, world: Yearbook since 1905; office table 262.

Butter.**Prices:**

Farm, United States, by States, first of month, since 1909. Commencing March, 1909; also Yearbook of department.

Wholesale, monthly range on specified markets, 1895. Since 1899, monthly; Yearbook since 1900. Office table 294-21.

Wholesale, on some markets since about 1865. Report of statistician.

Butter—Continued.

Receipts:

Yearly, on specified markets, averages 1891-95, 1906-1910, and 1901 to date. Yearbook, 1918, p. 608, and yearly.

Monthly, on specified markets, January 1, 1912. October, 1912.

Cabbage.

Acreage:

By States. November, 1915, p. 73.

Commercial, Southern States. April, 1917, p. 33; January, 1920, p. 4.

Commercial, in important States. January, 1916, p. 5; September, 1919, p. 87.

Commercial, harvested, in important States. September, 1916, p. 92; December, 1916, p. 122.

Commercial, in important States. Since November, 1914; usually in February, March, April, August, October, and December (Truck Crop Division).

For kraut, by States, 1915-1918. February, 1917, p. 18; March, 1918, p. 25; July, 1918, p. 81.

For kraut, by States. Since January, 1917; usually in August, September, December (Truck Crop Division).

In certain States, 1913-14. December, 1914, pp. 11-12.

Percentage in certain States. October, 1908, p. 76.

Condition:

By States. Since 1906, June to September, inclusive.

Commercial, by States. Since April, 1915; usually twice a month during season (Truck Crop Division).

In Florida. Since 1909; usually in May and November.

In Florida. Since 1912, in March and April.

Kraut crop, by States. Since August, 1916; usually twice a month during season (Truck Crop Division).

Dates of planting and harvesting, by States. Office table 273-2.

Prices:

To producers, by States. Monthly since January, 1910.

Wholesale, at three United States markets. Monthly since 1911. Office table 294-28.

Price and value:

Special Reports. Jan. 27, 1920 (Truck Crop Division Weekly News, Jan. 26, 1920).

Special Reports, kraut crop. Apr. 13, 1920 (Truck Crop Division Weekly Crop and Market Review).

Production:

By States and counties. November, 1915, p. 73; September, 1916, p. 92; December, 1916, p. 122.

Forecast from condition, by States. 1917, September, October, November.

Commercial, by States. Since November, 1914; usually in August, revised in December (Truck Crop Division).

For kraut, by States. March, 1918, p. 25.

For kraut, by States. Since January, 1918; usually in December (Truck Crop Division).

In certain States. December, 1914, pp. 11-12.

Per cent of full crop, by States. Since 1906; usually in October.

Cabbage—Continued.

Shipped out of county where grown, by States and varieties. January, 1916, p. 5.

Varieties, per cent of crop, by States. January, 1916, p. 5.

Yield per acre, by States. Since 1911; usually in October or December.

Calves.**Prices:**

Farm, per 100 pounds, 15th of month, by States. Since February 15, 1910.

Monthly trend, per 100 pounds, to producers, average 1910-1914. Chart, July, 1915, p. 8.

Wholesale, on prominent markets of specified countries in specified years. Bul. 109.

Receipts:

Yearly, 1900-1913, at principal markets. Farmers' Bulletin 575, p. 12. and usually thereafter in January or February. Office table 246.

Monthly at specified markets, 1911-1913. June, 1913, p. 45.

Camels.

Number, world. Yearbook since 1905.

Cantaloupes.**Acreage:**

1915 and 1916, 6 States. 1910, in August, p. 80.

Commercial, 7 States, 1917 and 1918. 1918, in July.

Estimate of commercial, 14 States, 1915-1917. June, 1916, p. 53; June, 1917, p. 51.

Production, commercial, 12 States, 1916; forecast 1917. July, 1917, p. 65.

Condition, by States. Since 1906, in May, June, July, and August.

Per cent of United States acreage in State, by States. August, 1908, p. 60 (based on 1900 census).

Per cent harvested, April-September, by States. June, 1916, p. 53.

Planting dates and harvest, etc., by months and by States. Office table 273-2.

Production:

Compared with average, United States. Since 1910, in November.

Percentage of a full crop, by States. Since 1906, in September.

Cantaloupes (California and Florida)

Condition. Since 1906, in May, June, July, and August.

Production, compared with a full crop. 1912, in September.

Carrots.

Condition, by States. Since April, 1915; twice a month during season (Truck Crop Division).

Cattle.

Birth rate per 1,000, average monthly. February, 1913, p. 14.

Condition, since 1889, with 1898 and 1902 missing. April since 1903.

Losses, since 1884, with 1915 missing. Bulletin 109 and April since 1903.

Industry, changes in, January 1, 1919, compared with 1920. July, 1920, p. 69.

Number (other than milch cows), average price, and total value, in United States, by States, on January 1. Since 1867.

Cattle—Continued.

Number (including milch cows) on farms, by geographic divisions, from 1840. Report 109 and office table 358.

Number, world: Report 109; Yearbook since 1905; office tables 262 and 403. Number in foreign countries, recent estimate and before the war. February, 1918, p. 16; office table 323.

Number (except calves) slaughtered at principal places, 1884–1914. Report 109, p. 307.

Population and beef cattle compared, east and west, United States, 1919, 1910, 1900, 1890. 1880. October, 1919, p. 101.

Prices:

Farm, per 100 pounds, United States, by States; beginning January, 1910, monthly.

Monthly trend to producers, per 100 pounds, average 1910–1914. Chart, July 15, 1915, p. 8.

Monthly wholesale, on specified markets, since 1896. Yearbook 1900. Table 294–20.

Wholesale, on prominent markets in specified countries in specified years. Report 109.

Other than milch cows, estimated averages for the United States, by ages or classes on January 1, 1911–1917. January, 1917, p. 11, and yearly thereafter in February.

Proportion of total belonging to different breeds in the United States, by States. June, 1920, p. 53.

Receipts:

Yearly, at specified markets, 1900. Commencing February, 1911, Yearbook; office table 246.

Monthly, at specified markets. June, 1913, p. 45, and following in June.

Value,¹ aggregate, United States, by States, comparisons, 1917, 1918, and average 1912–1916. February, 1918, p. 16, and following in February.

Cauliflower.**Condition:**

By States. Since April, 1915; twice a month during season (Truck Crop Division).

In California. Since 1912, in March.

Production, per cent of full crop, in California. Since 1912, usually in May.

Celery.**Acreage:**

By (5) States and counties, 1915–16. November, 1916, p. 116.

By States. Since October, 1918; usually in March, August, September, and December (Truck Crop Division).

In California: 1916–17 and 1917–18; November, 1917, p. 109.

Carloads:

Standard in California. November, 1917, p. 109.

By States. Since April, 1915; twice a month during season (Truck Crop Division).

Condition, in California, since 1912. In March.

Dates of planting and harvesting, by States. Office table 273–2.

¹ Includes hogs and sheep.

Celery—Continued.

Production :

By States. October and December, 1919 (Truck Crop Division).

Per cent of full crop, in California. Since 1912, usually in April.

Cheese.

Number of factories and output. May, 1910, p. 2.

Number of factories in State of Washington. May, 1901, p. 7.

Prices, range of on specified markets, since 1895. June, 1899, and monthly ; Yearbook since 1900 ; on some markets since about 1865 ; Report of Statistician.

Production, annual, in United States, January, 1901, p. 7.

Clover (Hay).

Acreage :

By States. Since 1912, usually in August.

Per cent of preceding crop, by States. Since 1866, usually in June.

Sown with winter wheat. January, 1919, p. 2.

Per cent of United States total grown in each State. June, 1908, p. 43.

In foreign countries 1910-1912. Office table 260.

Condition, by States. Since 1866, usually in June or July.

Prices paid to producers, by States. Monthly since May, 1914.

Production :

By States. Since 1912, usually in September ; since 1915, revised in December.

Per cent of full crop, by States. Since 1866, usually in August.

Of clover and timothy, by States. Since 1915, usually in December.

In foreign countries. Office table 260.

Quality, by States. Since 1877, usually in August.

Seed used per acre in United States. June, 1913, p. 48.

Varieties :

Red, principal growing regions, etc., September, 1915, p. 50.

Alsike, principal growing regions. February, 1917, p. 17.

Yield per acre, by States. Since 1912, usually in August.

Clover (Seed).

Adulteration. March, 1909, pp. 21-22. March, 1910, pp. 21-22.

Acreage, per cent of preceding crop, by States. Since 1892, usually in September.

Condition, by States. Since 1904 in September ; since 1913 in October.

Prices :

To producers, by States. Monthly since January, 1910.

Paid by farmers, by States. Monthly since June, 1912.

Wholesale, at four United States markets. Monthly since 1896 ; office table 294-8 ; also Yearbooks.

Production, per cent of full crop, by States. Since 1906, usually in November.

Yield per acre, by States. Since 1911, usually in November.

Cold Storage.

Time, costs, etc. Bureau of Statistics Bulletins, 93, 101.

Condition. (For further details see each crop.)

Monthly during season. Since 1866 : Apples, barley, buckwheat, corn, cotton, hay, grapes, oats, peaches, pears, potatoes, sorghum for sirup, tobacco, wheat.

Since 1867 : Hops, sugar cane.

Condition—Continued.

Monthly during season—Continued.

Since 1868: Sweet potatoes.

Since 1882: Meadows, pastures.

Since 1894: Rice.

Since 1903: Flaxseed.

Since 1904: Clover seed.

Since 1906: Alfalfa, blackberries, broom corn, cabbage, canteloupes, cranberries, field beans, field peas, hemp, lemons, millet, onions, oranges, peanuts, raspberries, sugar beets, tomatoes, watermelons.

Since 1907: Grapefruit, lima beans, limes, pineapples, strawberries.

Since 1911: Almonds, apricots, olives, prunes, walnuts.

Since 1912: Cauliflower.

Composite estimate of all important crops since 1910, monthly during growing season.

Interpretation of condition estimates in items of quantities (equivalents of 100 per cent of normal): December, 1909, pp. 86-87; July, 1911, pp. 53-55; and once a year since 1911.

Consumption (of Farm Products).

Per capita:

United States, normal consumption of miscellaneous articles. Office tables 379, 309.

United States and foreign countries, cereals. Office tables 388, 239, 239A.

United States and foreign countries, meats, etc. Office tables 347, 348.

United States and foreign countries, sugar. Office tables 319, 324, 378-3, 384.

Wheat, United States, 1909-1920. Office table 405.

Other articles (see each article).

Cordwood.

Consumption, on farms. March, 1917, p. 24; January, 1918, p. 4; March, 1919, p. 32.

Corn (Field).

Acreage:

By States, since 1866. Usually in July; revised in December.

Foreign countries. Since 1904, Yearbook; office table 325-2.

Condition. Since 1866, in July, August, October; since 1867, in September, except 1877 to 1881.

Consumption:

By brewers, 1915-1918. November, 1918, p. 135.

By classes of live stock. August, 1919, p. 77; October, 1914, pp. 8-9.

Monthly on farms. June, 1919, p. 57.

In towns and on farms, by uses. June, 1917, p. 50.

Per capita of population, United States and foreign countries, 1902-1911, October, 1918, p. 124; and 1909-1913 and 1914-1918, Yearbook 1919, Table 88.

Damage to crop:

Causes and amount, 1909-1918. November, 1919, p. 117.

Causes of 1909-1911. June, 1912, pp. 46-48.

By frost, since 1909. November, 1915, p. 68; December, 1915, p. 82; October, 1917, p. 101; November, 1917, pp. 110-111; November, 1919, p. 117.

Corn (Field)—Continued.

Harvesting, date of:

By State. January, 1912, pp. 4-5; Bureau of Statistics Bulletin 85.

Methods of. November, 1918, p. 140.

Per cent monthly. October, 1919; p. 104.

For silos. July, 1915, p. 4.

Marketings monthly from farms. Since 1914, in October.

Merchantable per cent. Since 1884, usually in March.

Planting, dates of:

By States. May, 1912, p. 35; June, 1915, p. 5 (chart.) Bureau of Statistics Bulletin 85; April, 1913, p. 32 (map).

Per cent of replanting required. June, 1918, p. 64.

Prices:

Corn and hog compared, 1910-1916. September, 1916, p. 86 (chart) and usually each year since.

Geographic phases, Department Bulletin 696.

To producers, by States, on December 1. Since 1866, monthly since January, 1908.

Trend of 1908-9 to 1914-15. October, 1915, p. 61.

Wholesale. At United States markets. Monthly since 1865. Office table 294; also Yearbooks.

Production:

By States. Since 1866, usually in November; revised in December.

Forecast from condition, by States. Since 1911 each month, July to October, inclusive.

In foreign countries. Usually once a year or oftener, since 1895.

Cost of, by States, 1909. April, 1911, p. 30.

Quality, by States. Since 1866, usually in November, except 1877-1881, 1883, 1890, 1893.

Seed:

Deficiency and surplus in 1918 in Central States. March, 1918, p. 29 (with map).

Testing and germination. June, 1918, p. 64.

Used per acre in United States. June, 1913, p. 48.

Shipments out of county where grown, by States, since 1910, usually in March.

Stocks on farms,

By States, since 1883, usually in March, and since 1896, usually in November.

Relative stocks, January 1, 1917, and 1918. May, 1918, p. 52.

Supply and distribution, since 1897. March, 1920, p. 26.

Value on farms, by States, since 1866, usually in December.

Varieties, per cent of crop, by States, since 1915, usually once each year. (1917-18, Feb., 1919, p. 21.)

Yield per acre, by States:

Since 1866, usually in November. Revised in December.

Annual changes in United States since 1866. January, 1919, p. 3.

Equivalent to 100 per cent (or normal) condition. Usually once a year since 1911.

In foreign countries since 1890. Office table 312; also Yearbooks.

Largest reported in United States. January, 1918, p. 2.

See also "Freight Charges."

Corn (Pop).

Acreage, by States, 1909. Office table 230 (Thirteenth Census data).

Farms growing pop corn in 1909, by States. Office table 230 (Thirteenth Census data).

Prices to producers, by States. Monthly since November, 1912; Office table 293-57.

Value on farms, by States. 1909. Office table 230 (Thirteenth Census data).

Corn (Sweet).

Acreage for canning:

1913-1915. July, 1915, p. 11; 1917-18; Yearbook. 1919, Table 184.

By States, 1915-1917. February, 1916, p. 17; December, 1916, 122; August, 1917, p. 76.

Since 1915, usually in September and October (Truck Crop Division).

Condition for canning:

Since August, 1916; usually twice a month during season (Truck Crop Division).

Since April, 1915; usually twice a month during season (Truck Crop Division).

Packed:

In United States, 1904-1908. Office table 25-B.

In United States and Canada, 1903-1905. January, 1904, p. 71; December, 1904, p. 65; February, 1915, p. 84.

In Minnesota. January, 1908, p. 8.

Prices:

Average, for, canning corn. Special report by Truck Crop Division, March 4, 1920.

Wholesale, of canned, at New York, by months since 1912. Office table 294-32.

Production, for canning:

Since 1917. Usually in October (Truck Crop Division).

1917-18. Yearbook, 1919, p. 184.

Dates of planting and harvesting and per cent planted and harvested each month, by States. Office table 273-2.

Value of crop for canning. Special report by Truck Crop Division, March 4, 1920.

Cotton.

Acreage:

Abandoned. Since 1900, in December.

In cultivation, by States. Since 1866, usually in July; revised in December.

Harvested, by States, 1910-1919. Yearbook 1919, Table 126.

Sea Island and Egyptian, by States, 1917-1919. August, 1918, p. 87; July, 1919, p. 67.

Also production in Arizona, 1913-1919. Office table 398 (chart).

In foreign countries. Usually once a year or oftener since 1911; also Yearbook.

In Imperial Valley (Mexican only), 1914-15. November, 1915, p. 73 (later years with United States data).

Per cent of land area, by States. April, 1910, p. 30.

Commercial movement, 1895-1903. Division Statistics circulars 4, 6, 7, 8, 9; and Division Statistics bulletins 17, 19, 28, 34.

Cotton—Continued.

Condition by States. Since 1866 in August; since 1867 in July and September; since 1871 in June; since 1919 in October.

Consumption:

United States and Canada. January, 1915, p. 13.

In United States and changes in. November, 1914, p. 11.

Damage, causes, and extent:

By States. 1909, June 12, p. 46.

1909-18. August, 1919, p. 75.

Disposal, monthly by producers, by States. October, 1916, p. 99; August, 1915, p. 32.

Estimates compared with ginning report of Bureau of the Census, 1900-1901 to 1915-16. June, 1916, p. 58.

Estimates of acreage, condition and production compared to census report, 1910-1918. Office table 373.

Fertilizer:

Commercial, sold in Cotton States, 1914-1916. July, 1916, p. 69; July, 1915, p. 5.

Cost and quantity per acre, by States. June, 1917, p. 50.

Kinds, quantity per acre, proportion of fields receiving, by State. August, 1917, p. 77; October, 1916, p. 100.

Freight rates:

From United States ports to Liverpool. Monthly quotations since 1905. Office table 288-A.

Ocean, 1910-1915. December, 1915, p. 80.

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Lint, length of, by varieties, by States, 1915-16. June, 1917, pp. 52-53 (general discussion, including prices, proportions, varieties, yields, etc.); June, 1920, p. 52. Department Bulletin 733.

Planting:

Dates of by States. May, 1912, p. 35.

Normal period, by States. June, 1915, 7 (chart).

Picking: Normal period, by States. June, 1915, p. 7 (chart).

Prices:

In United States (farm, New York, or export prices). Since 1790. Office table 294-10.

To producers, by States. On December 1, since 1876, excepting 1877 and 1881; monthly since January, 1908. Office table 293-10.

To producers, long staple, short staple, and Sea Island compared, by States, 1915-16. June, 1917, p. 53.

To producers, yearly weighted average, United States and States, 1915-1918. July, 1919, p. 65.

To producers, in United States, 1869 to 1910. December, 1910, p. 94.

Middling at New York, 1870-1909 (New York Chamber of Commerce). Office table 97.

Spot prices of middling upland at New Orleans, New York, and Liverpool. October, 1915, p. 61.

Paid for picking, by States. October, 1918, p. 128.

Wholesale, at United States markets. Monthly since 1891. Office table 294-10; Yearbooks.

Production:

By States. Since 1866, usually in December.

Cotton—Continued.

Production—Continued.

Cost of, by States, Division Statistics bulletin 16. November, 1914, pp. 12-14.

Forecast from condition, by States. Since 1911, each month, June to October, inclusive.

Also acreage in Arizona, 1913-1919. Office table 398 (chart).

Of lint, by States, 1910-1919. Yearbook 1919, table 127 (Bureau of Census data).

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Per cent of long staple, short staple, and Sea Island by States. June, 1917, pp. 52-53.

Per cent of "world" crop produced in United States, 1900-1909. May, 1911, p. 37.

Snapped and bolly, by States, 1917. October, 1918, pp. 120-121.

And Prices, 1791-1895. Division Statistics bulletin 9.

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Requirements, by States. Office table, 313-9.

Used per acre. June, 1913, p. 48.

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Production of agricultural products (discussion). December, 1914, pp. 12-13.

Stocks at interior towns, 1902-1907. Several times each year at irregular intervals (commercial estimates).

Supply and distribution, 1881-1913. November, 1914, pp. 9-12.

Varieties, length of staple by States producing, 1915-16, June, 1917, pp. 52-53.

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In United States 1790-1905. March, 1907, pp. 18-19.

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To producers, by States. Monthly since September, 1910.

To producers, yearly average price, by States, 1915–1918. July, 1919, p. 65.

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By States, since 1917. Usually in December.

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Cranberries.

Acreage (3 States). Since 1914, in December.

Condition, by States. Since 1906, in September and October.

Estimated commercial crop of the United States, in bushels, by the American Cranberry Growers' Association, 1895-1903. Crop Report, March, 1904, p. 92.

Percentage of United States acreage, in States (based on Census of 1900). October, 1908, p. 76; September, 1908, p. 68.

Prices (3 States), December 1. Since 1914.

Production:

Three States. Since 1914, in December.

Compared with average, United States, 1912, in November.

Percentage of a full crop, by States. Since 1906, in November.

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By States. Since April, 1915; twice a month during season (Truck Crop Division).

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Pickle crop, by States. September and November, 1919 (Truck Crop Division).

For pickling in Michigan. December, 1915, p. 84.

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Yield per acre, for pickling, in Michigan. December, 1915, p. 84.

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To producers, by States, on December 1. Since 1902; monthly since January, 1908.

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Of seed, by States, census years 1850-1910 (Census data). Office table 282.

Of seed, by States. Since 1902, usually in November; revised in December.

Of seed, forecast from condition. Since 1911; monthly July to November, inclusive.

Seed and fiber, in foreign countries. Since 1896, usually at least once a year; also Yearbook.

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Seed used per acre. June, 1913, p. 48.

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Yield per acre:

By States. Since 1902, usually in November.

Equivalent of 100 per cent (or normal) condition. Once a year since 1911.

Largest reported. January, 1918, p. 2.

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Foodstuffs, production, consumption, and foreign trade of United States. March, 1917, p. 26.

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Freight Charges on Farm Products.

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By rail and lake. 1857–1900, Division Statistics Bulletin No. 15.

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By rail, lake, and ocean. 1881; Yearbooks, 1905–1912; Office table 259, 259A, 288B.

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Ocean, monthly. 1905; Yearbooks, 1905–1912; Office table 288, 288A.

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By river, 1912. Department Bulletin 74.

Fruits and Nuts, Miscellaneous.*Bananas:*

Production in Florida: 1889–91–93–95–97–99; Quantity and value, March, 1902, p. 2 (Florida Report).

California fruit and nuts:

Shipments of. Yearbook, 1901, p. 712.

Statistics of fruits in principal countries. Bulletin 483, February, 1917.

Cherries:

Commercial, by States. July, 1917, p. 57; July, 1918, p. 79.

Coconuts:

Coconut and copra and coconut-oil industry in United States (discussion). August, 1904, p. 28.

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Acreage, commercial, in Louisiana, Arkansas, Texas, California, 1916 and 1917; May, 1917, p. 40.

Condition, by States, since April, 1915. Twice a month during season (Truck Crop Division).

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Industry in the United States and foreign countries. May, 1899, p. 2.

Grain Sorghums, Kafirs, etc.

Acreage, by States. Since 1915, usually in December.

Grain, Sorghums, Kafirs, etc.—Continued.

Consumption of grain, per cent used for seeding and sown for forage.

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Crop, in Oklahoma, in 1907. March, 1909, p. 24.

Condition, by States. Since 1906, usually each month, July to October.

Prices, to producers. On December 1 since 1915; monthly since April, 1916; also office table 293-70.

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By States. Since 1915, usually in July; revised in December.

Forecast from production. Since 1915, usually in July, August, and September.

Per cent of full crop of grain and forage, by States. Since 1906, usually in November.

Value, by States. On December 1 since 1915.

Yield per acre, of grain and forage. Since 1916, usually in November.

Grapefruit (Florida).

Conditions. Since 1907, in March and November.

Prices, per crate, 1st of month. Since 1908, in March.

Production:

Percentage of a full crop. Since 1907, in December.

Compared with average. November, 1910.

Per 100 trees. Since 1912, in December.

Quality. Since 1912, in December.

Grapes.

Condition, by States. Since 1866, in July, August, September, and October, except in 1879, 1898-1901.

Per cent United States vines grown in each State (based on 1900 census).

1908, July, August, October, pp. 53, 60, 76.

Prices, by States, per pound (July-December). Since 1910, in September.

Production, by States, percentage of a full crop. Since 1866, in November, except 1877-81.

Quality, by States. Since 1910, in November.

Grapes (California).

Raisin, table, and wine:

Condition. Since 1911, July to November.

Production, percentage of a full crop. Since 1911, October, November, and December.

Quality. Since 1911, October, November, and December.

Yield per acre. Since 1911, October, November, and December.

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(See *Planting and harvesting periods*; also Bulletin 85, Bureau of Statistics).

Hauling.

By wagon and motor truck, discussion. October, 1918, p. 125. Office table 397.

By wagon. April, 1915, p. 11; Bu. Statistics Bul. 49.

Hay (All).¹**Acreage:**

By States. Since 1866, usually in May, revised in August and December.

In Canada, 1916 and 1917. September, 1917, p. 83.

Condition, by States. Since 1882 in May; since 1908 in June and August.

Consumption, by live stock, on farms in United States. October, 1914, p. 8, 9; since 1911 monthly in May.

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Percentage baled, by States. October, 1918, p. 119.

Prices:

To producers, by States. On December 1 since 1866; "loose hay," monthly since January, 1908. Office table 293-9.

To producers, by States. "Baled hay," November, 1915. Office table 293-14.

Wholesale, at four United States markets. Monthly since 1895. Office table 294-7, and Yearbooks.

Production:

By States, since 1866, usually in September; revised in December; except 1890-1911.

Forecast from condition by States. Since 1911, monthly, May to August, inclusive.

By kinds. Since 1915, usually in December.

Quality, by States. Since 1866, usually in September, except 1877-81, 1883, 1890, 1892.

Stocks on farms, by States. Since 1909, usually in May; 1910-19, May, 1919, p. 48.

Value on farms, by States. Since 1866, usually in December.

Varieties, per cent of crop, by States. January, 1919, p. 2.

Yield per acre:

By States. Since 1866, usually in September; revised in December.

Annual changes 1866 to 1889. January, 1919, p. 3.

Equivalent to 100 per cent (or normal) condition. Since 1911 once a year.

By varieties and States, 1918. January, 1919, p. 2.

Hay (Tame).

Acreage, by States: Since 1866, usually in August; revised in December.

Condition:

By States. Since 1882 in May; since 1908 in June and August.

Of meadows in Florida. 1882 in May; since 1911 in March.

Harvesting (see individual hay crops).

Prices:

To producers. On December 1 since 1866; monthly since May, 1914.

Wholesale, at five United States markets. Monthly since 1895; office table 294-7; also Yearbooks.

Production:

By States. Since 1866, usually in September; revised in December.

By varieties, by States. Office tables 399, 371.

¹ Includes tame and wild hay 1866 to 1889; tame hay only 1890 to 1913, and tame and wild since 1912.

Hay (Tame)—Continued.

Quality, by States. Since 1866, usually in September, except 1877–81, 1883, 1890, 1892.

Value on farms, by States. Since 1866, usually in December.

Varieties:

Per cent of crop, by States. January, 1919, p. 2.

Area and production of, in 1919. Office table 396.

Yield per acre:

By States. Since 1866, usually in September; revised in December.

Annual changes in United States since 1890. January, 1919, p. 3.

By varieties and States, 1918. January, 1919, p. 2.

Hay (Wild).

Acreage, by States. Since 1909, usually in August; revised in December.

Prices to producers (prairie hay), by States. Monthly since May, 1914.

Production, by States. Since 1909, usually in September; revised in December.

Quality, by States. Since 1914, usually in September.

Yield per acre, by States. Since 1909, usually in September; revised in December.

Hemp.

Acreage:

By (2) States. Since 1915, usually in December.

By States, 1909 (Census data). Office table 214.

Per cent of United States, in each State. June, 1908, p. 44.

In Philippines. February, 1919, p. 21.

Condition, by States, since 1906. Monthly, June to September.

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By (2) States. Since 1915, usually in December.

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Per cent of full crop, by States. Since 1906, usually in October.

In foreign countries, occasionally since 1889.

In Philippines, 1915–17. February, 1919, p. 21.

Weight per bale, in Philippines. August, 1916, p. 83.

Value:

On farms, by States. Since 1915, usually in December.

In Philippines. February, 1919, p. 21.

Yield per acre, by States. Since 1911, usually in October.

Honey.

Prices, farm, United States, by States, 15th of month. January, 1910, and monthly. Office tables 293–28 and 293–29.

Production:

Yield per colony, by States, in United States. September, 1914;

Farmers' Bulletin 620, p. 7; following usually in September.

In Mexico, 1903–1904. December, 1909, p. 58.

Hops.

Acreage:

By (4) States. Since 1915, usually in October; revised in December.

By States, 1899 and 1909 (census data). Office table 237.

In Wisconsin, by counties. Office table 45–A.

In foreign countries. Since 1895, usually once a year or oftener.

Hops—Continued.

Condition, by States. Since 1867, excepting 1878–1889, in September. Since 1895, in August; since 1906, in July.

Consumption and movement, in United States, 1900–1919. Usually once a year; also Yearbook.

Crop, in Washington. November, 1916, p. 117.

Price to producers, by States.¹ On November 15 since 1915; monthly since January, 1910.

To producers, in United States. Monthly since 1910. Office table 293–59.

Wholesale at four United States markets. Monthly since 1913. Office table; also Yearbooks.

1790–1911, Bureau Statistics circular 35.

Production:

By (4) States. Since 1915, usually in October; revised in December.

By States, 1899 and 1909 (census data). Office table 237.

In Wisconsin, by counties, 1880–1906. Office table 45.

In foreign countries. Since 1895, usually once a year or oftener.

United States, 1839–1911. Bureau statistics circular 35; also Yearbook.

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Quality, by States. Since 1882, except 1884, 1887, 1892–3, 1896–1898, usually in October.

Value on farms, by States. Since 1915, usually in November; 1899 and 1909 (census data), office table 237.

Yield per acre, by States. Since 1882, except 1884, 1887, 1892–3, usually in October; revised in December.

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Average price and total value, United States, by States. January 1 each year since 1867.

World, office table 262; Yearbook since 1905.

In foreign countries, recent years. Office table 403–3.

Used per plow in United States, by States. February, 1918, p. 16.

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Farm, United States, by States. Fifteenth of month since February, 1910; April, 1910, and following.

Estimated averages for United States, by ages or classes, on January 1, 1911–1917. January, 1917, p. 11, and following in February.

Wholesale, on specified markets, from 1896. Yearbook since 1900.

Receipts at specified markets, 1900 to date. Table 248. On some markets since 1869. Report of statistician.

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Productivity, various countries. June, 1913, p. 47.

Production, world's crops, 1900-1911. May, 1913, p. 35.

Production, price, and yield of 10 products, 1866-1910. March, 1911, p. 21.

Labor (on Farms).

Families on farms, in United States and Japan, 1914. August, 1917, p. 77.

Supply and demand. Since 1918, usually in April.

Wages, by States. Since 1866, usually in March.

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Birth rate, monthly. February, 1913, p. 14.

Losses from disease, year ending March 31, since 1912. April, 1912, and following (1915 missing); Bulletin 109.

Number (sheep and lambs): World, office table 262.

Slaughtered at principal places, 1884-1914. Report 109, p. 307.

Prices:

Farm, per 100 pounds, on 15th of month, United States, by States, Dec. 15, 1909. January, 1910, and following.

Monthly trend per 100 pounds to producers, average 1910-1914. Chart, July 15, 1915, p. 8.

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Distribution, continental United States, 1910. July, 1912, pp. 52-54.

Size of fields, United States. August, 1910, p. 63.

Tillable land, percentage under cultivation, by States. Weekly News Letter, January 28, 1914 (vol. 1, No. 25, p. 2).

Value per acre, with and without improvements, by States, 1913-14. Office table 351.

Value of plowland, by States. Since 1912, usually in March.

World's productive area. August, 1919, p. 78.

Lemons (California).

Condition. Since 1906, March to November.

Prices, per box, 1st of month. Since 1911, in September.

Production, percentage of a full crop. Since 1906, in December.

Quality. Since 1911, in December.

Yield per acre. Since 1911, in December.

Lemons (Florida).

Condition. 1911, in September; 1912, in April, May, and June.

Lettuce.

Acreage, by States. October, 1919 (Truck Crop Division).

Condition, by States. Since April, 1915; twice a month during season (Truck Crop Division).

Dates of planting and harvesting, by States. Office table 273-2.

Production, by States, January, 1920 (Truck Crop Division)

Limes (Florida).

Condition. Since 1907, March to November.

Prices. Per crate, 1st of month. Since 1908, in March.

Limes (Florida)—Continued.

Production, percentage of a full crop. Since 1907, in December.

Quality. Since 1915, in December.

Live Stock.

(For further details see each class of live stock.)

Condition. Since 1889, cattle, horses, mules, sheep, swine, April.

Freight rates, rail and ocean, 1881 to 1915. Office table 259; Yearbooks.

Losses. Since 1884, cattle, sheep, and swine; since 1888, horses and mules; since 1910, lambs.

Number and value, January 1. Since 1867, cattle, milk cows, horses, mules, sheep, swine.

Value, aggregate. Since 1918, February.

Meats.**Consumption:**

United Kingdom, 1907-8. September, 1909, p. 64; Report 109.

United States and foreign countries. February, 1912, p. 9; latest year available, tables 347, 348, 379.

And production, 1900 and 1909, by kinds. Farmers' Bulletin 575, p. 26; Report 109, p. 263.

And production, 19 years. March, 1919, pp. 30-31; March, 1920, p. 27.

Estimated, per capita, urban and rural, by divisions in the United States. October, 1919, p. 105; corrected, November, 1919, p. 116.

And production in Germany, 1904-1913. Report 109, pp. 264-267.

Total, by kinds and countries, in specified years. Report 109, p. 271; per capita, 272-273, Report 109.

Prices:

Index number of, to producers of meat animals in United States, by months, 1911-1917. May, 1917, p. 40; 1912-1918, February, 1919, p. 9; and following in February.

Wholesale, of fresh meats on prominent markets in various countries. Report 109. On some markets since 1865. Report of statistician.

Wholesale of beef, canned, at Chicago, by months, 1912 to date. Office table 294-230.

Beef (mess), per barrel at Chicago, 1870-1909. Office table 97.

Hams (smoked), wholesale, at Chicago, by months, 1912 to date. Office table 294-29.

Lard, wholesale, at Chicago, by months, 1912 to date. Office table 294-331.

Production:

Beef, mutton, pork, total and per capita, 1900-1916. Office table 301.

Beef and pork, yearly average, five-year periods, 1852-1856, 1912-1916, and each year 1911-1919. Office table 359-1.

By kinds, net supply, 1915-1918. Office table 356.

Ratio of slaughter to stock of animals (cattle, sheep, swine) in United States, United Kingdom, and Germany, in specified years. Report 109, pp. 269-270.

Value, estimated of animals and animal products (including poultry), 1897-1915. January, 1916, p. 3, and yearly in January.

Weight, average dressed, of cattle, sheep, and swine in specified countries. Report 109, pp. 267-277.

Milk.

Prices, average, to producers. 1910 to date, monthly; office tables 293-24 and 293-25; April, 1910, p. 32, and following in almost every issue.

Milk—Continued.

Production:

1918 and 1917 compared. February, 1919, p. 19; Yearbook, 1918, p. 707.

And value. January 31, 1916, p. 2.

Milk Cows.

Number, average price, total value in United States, by States. January 1, since 1867. 1904, usually in February. Yearbook.

Number, world. Yearbook since 1905.

Prices, farm, 15th of month, United States, by States, February, 1910. April, 1910, and following.

See also *Cattle*.

Millet.

Acreage, in Asiatic Turkey, 1910. January, 1913, p. 15.

Condition, by States. Since 1906, usually in June and September.

Crop, in certain foreign countries. Crop Records Division files.

Prices, range by months at Chicago, 1905–1915. Office table 268.

Production:

By States. Since 1915, usually in December.

Per cent of full crop (hay and seed), by States. Since 1906, usually in October.

Mint.

Crop in Indiana and Michigan, 1914–1918. September, 1919, p. 91.

Mules.

Losses from disease, year ending March 31. Since 1888 (1915 missing); condition April 1, since 1889 (1898, 1902 missing). April, 1912, and following each year in April.

Number, average price, and total value in United States, by States. January 1, since 1867; February, 1904, and following in February. Also Yearbooks.

Number, world. February, 1910, p. 14. Yearbook since 1905.

Prices:

Estimated averages for United States, by ages or classes, on January 1, 1911–1917. January, 1917, p. 11, and following in February.

Comparisons in South. February, 1920, p. 15.

Weight of mature, in United States. February, 1918, p. 10.

Mules and horses, value, aggregate, United States, by States; comparisons, 1917, 1918, and average, 1912–1916. February, 1918, p. 16, and following yearly in February.

Nuts.*Almonds (California):*

Condition. Since 1911, May to October.

Production, percentage of a full crop. Since 1911, in November.

Walnuts (California):

Condition. Since 1911, June to October.

Price, per bushel, 15th of each month. Since October, 1912; also Office table 293–37 to date.

Black walnuts:

Prices, 15th of Month, per bushel, by States (October to February). Since 1912, in October.

Price averages, United States, per bushel (October to February). Since 1912, in October; Farmers' Bulletin 641, p. 38.

Nuts—Continued.*Hickory nuts:*

Price averages:

United States, per bushel (October to February). Since 1912, in October.

15th of each month, per bushel, by States (October to February).

Since 1913, in October; also office table 293-38.

Pecans:

Condition, July 1, by States, 1916-17-18. July, 1918, p. 79.

Price, per bushel, 15th of each month. October, 1914; also office table 293-40.

Production:

1919, with comparisons, by States. November, 1919, p. 115.

Per cent of a full crop, by States. November, 1917, p. 112; November, 1916, p. 117.

Per cent of a full crop, with comparisons, 1915-1918, by States. November, 1918, p. 138.

Chestnuts:

Price, per bushel, 15th of each month, October, 1914, to date. Table 293-41.

Oats.

Acreage:

By States. Since 1866, usually in June; revised in December.

In foreign countries, 1917-1919. January, 1920, p. 3; Yearbooks since 1905.

Winter sown, by States. May, 1918, p. 52.

Condition, by States. Since 1866, in June and August; since 1867, in September.

Consumption:

By classes of live stock. August, 1919, p. 77; October, 1914, p. 8-9.

Monthly on farms. June, 1919, p. 57.

Per capita of population, United States and foreign countries, 1902-1911. October, 1918, p. 124; 1909-1913 and 1914-1918, Yearbook 1919, table 88.

Damage to crop, causes of, by States, 1909-1911. June, 1912, p. 46.

Dates of sowing and harvesting in different countries. Office table 297-1.

United States, by States, Bureau Statistics Bul. 85.

Harvesting:

Per cent monthly for United States. October, 1919, p. 104.

Methods of, by States. February, 1917, p. 14.

Marketings monthly from farms, since 1913. September, 1918, p. 105, and October, 1919, p. 102.

Plantings, dates of, by States. May, 1912, p. 35; Bureau Statistics Bul. 85.

Prices:

To producers, by States. On December 1, since 1866; monthly, since January, 1908.

Geographic phases, 1911-1914. Department Bul. 755.

Trend of. Monthly, 1908-1914 and 1914-15; October, 1915, p. 60.

Wholesale at eight United States markets, monthly since 1895. Office table 294-2; also Yearbooks.

Production:

By States, since 1866; usually in October; revised in December.

Forecast from condition, by States. Since 1911, in June, August, September, October.

Oats—Continued.**Production—Continued.**

In foreign countries. Since 1895, usually once a year or oftener; also in Yearbook; 1917-1919, January, 1920, p. 3.

Cost of, by States. June, 1911, p. 47.

Quality, by States. Since 1866, usually in October. Except 1877-1881, 1885, 1890-1, 1903.

Seed used per acre:

In United States. June, 1913, p. 48.

In foreign countries. April, 1915, p. 11.

Shipments out of county where grown, by States. Since 1910, usually in March.

Stocks on farms:

By States. Since 1895, usually in March and August.

Relative stocks, January 1, 1917 and 1918. May, 1918, p. 52.

Supply and distribution, since 1897. March, 1920, p. 26.

Value on farms, by States. Since 1866, usually in December.

Weight per measured bushel, by States. Since 1897, usually in November.

Yield per acre, by States:

Since 1866, usually in October, revised in December.

Annual changes in United States since 1866. January, 1919, p. 3.

Equivalent to 100 per cent, or normal condition. Usually once a year since 1911.

In foreign countries since 1890. Office table 312-3; also Yearbooks.

Largest reported in United States. August, 1916, p. 76; January, 1918, p. 2.

Olives (California).

Condition. Since 1911, June to November.

Production, percentage of a full crop. Since 1911, in December.

Onions.**Acreage:**

By States. Since 1913, usually in September, revised in November; since November, 1914, usually in May, August, September, and November (Truck Crop Division).

Bermuda, by States. Since March, 1916, usually in July and November (Truck Crop Division).

Percentage grown from seed. March, 1919, p. 29.

Per cent of total, by States. October, 1908, p. 76.

Condition:

By States. Since 1906, June to September, inclusive; since April, 1915, twice a month during season (Truck Crop Division).

Bermuda, by States. Since April, 1915, twice a month during season (Truck Crop Division).

Crop:

In Indiana. March, 1905, p. 95.

Commercial estimates, 1901. December, 1901, p. 8.

Dates of planting and harvest, by States. Office table 273-2.

Prices:

To producers, by States. Monthly since January, 1910.

Wholesale at three United States markets. Monthly since 1911.

Production:

By States, 1913-14, December, 1914, p. 11; since November, 1914, usually in August and November (Truck Crop Division).

Onions—Continued.

Production—Continued.

Bermuda. Since June, 1917, usually in July and November (Truck Crop Division).

Forecast from conditions. Since 1916, usually in September.

Per cent of full crop, by States. Since 1906, usually in October.

Quality for storage. October, 1915, p. 58.

Special report, price and value. Jan. 6, 1920, Weekly Truck Crop News.

Yield per acre:

By States. Since 1911, usually in October.

Bermuda, in Texas. March, 1917, p. 23.

Oranges (Florida and California).

Crop, boxes. 1889-90 to 1903-04, December, 1903, p. 64. (Florida Report); 1915, in December.

Condition. 1906, July to November.

Prices, first of month:

California, per crate, since 1911 in September.

Florida, per crate, since 1908 in March.

Production:

Since 1915, in December.

Percentage of a full crop. Since 1906, in December.

Price, value. July, 1916, p. 67.

Value, 1915-1919. December, 1917, p. 127.

Yield per acre. Since 1910, in December.

Quality. 1910, in December.

Oranges and grapefruit (Florida):

Crop, 1914-15-16. July, 1916, p. 67.

Commercial crop, 1916. December, 1916, p. 122.

Pastures.

Condition:

By States. Since 1882, in May to August, inclusive; since 1915 in September and October, and in other months in certain years.

In Florida. Since 1907, in March and April.

Peaches.

Condition:

By States. 1900, in June.

Florida. 1912, in April, May, June, July, and August.

California. 1912, in June, July, and August.

Georgia crop. July, 1917, p. 57.

Prices, 15th of month, per bushel (January to October). Since 1910, August.

Production:

By States. Since 1910, in September.

Percentage of a full crop, by States. Since 1867, in September.

Quality, by States. Since 1912, in September.

Commercial crop.

Centralized. July, 1918, p. 77.

Condition, by States. Since 1918, April to September.

Production, by States. Since 1918, in September.

Special commercial reports. May, 1918; July, 1918; July, 1919.

Peanuts.**Acreage:**

Harvested, by States. Since 1916, usually in December.

By types and States. May, 1918, pp. 49-50; January, 1920, pp. 4-5.

In foreign countries, 1912-1918. Yearbook 1919, table 183. Office table 367.

Crop, in Oklahoma, 1907. March, 1909, p. 24.

Condition, by States. Since 1906, monthly, July to October.

Dates of planting and harvesting, by States. Office table 273-1.

Hay, in Georgia. June, 1918, p. 64.

Price:

To producers, by States. Monthly since January, 1910.

Wholesale at Norfolk, by months. Since 1914. Office table 294-37.

Production:

By States. Since 1916, usually in December.

Compared with average in United States. 1906-1916, usually in November.

Per cent of full crop, by States. Since 1906, usually in November.

In foreign countries. Usually once a year, or oftener since 1905; Yearbooks; also office table 367.

Production and uses, by types and States. May, 1918, pp. 49-50; January, 1920, pp. 4-5.

Quality, by States. Since 1910, usually in November.

Seed, used per acre. June, 1913, p. 48.

Varieties, acreage, yield, etc. June, 1917, p. 54.

Value on farms, by States. Since 1916, usually in December.

Yield per acre, by States. Since 1919, usually in November.

Pears.**Condition:**

By States. 1908, June to October.

In Florida. Since 1866, except 1875-1907, April, May, June, July to October.

Per cent of United States trees in each State. June, 1908, p. 44 (based on 1900 census).

Prices, 15th of month, per bushel (August to January). Since January, 1910.

Production:

By States. Since 1910, in November.

Percentage of a full crop, by States. Since 1866, in November, except 1877-1881.

Commercial crop.

Condition, by States. Since 1919, July to November.

Production, by States. Since 1917, in November.

Special commercial report, 11 States, July, 1918 and 1919. July, 1919, p. 64.

Peas (Field).**Acreage:**

By States. 1919. Office table 215 (Thirteenth Census data).

Edible peas, by States. May, 1918, p. 51.

In foreign countries. Usually once a year or oftener since 1906; also Yearbooks; office tables 315-16.

Peas (Field)—Continued.

Condition :

By States. Since 1906, in June and October ; since 1907, in May.

In Florida. Since 1907, in May.

Consumption, for various purposes (Canadian field peas), by States. February, 1916, p. 19.

Dates of planting and harvesting (Canadian field peas), by States. February, 1916, p. 19.

Production :

By States, 1909. Office table 215 (Thirteenth Census data).

Edible peas, by States. May, 1918, p. 51.

Per cent of full crop (grain and forage), by States. Since 1906, usually in November.

United States and foreign countries, 1909-1918; Yearbook 1919, table 176; 1911-1917. Office table 325-17; 1907-1908. Office table 15.

In foreign countries. Usually once a year or twice since 1906; also Yearbook.

Seed used per acre. June, 1913, p. 48.

Yield per acre :

Edible peas, by States. May, 1918, p. 56.

Normal, of Canadian field peas, by States. February, 1919, p. 19.

Peas (Green).

Acreage :

Contracted for canning, 1913-1917. February, 1916, p. 17; December, 1916, p. 22; August, 1917, p. 76.

For canning, usually by States. Since 1915, usually in September and October; by Truck Crop Division.

For canning, 1917-18. Yearbook 1919, Table 184.

Condition :

Usually by States. Since April, 1915; twice a month during season; by Truck Crop Division.

Canning crop, usually by States. Since August, 1916; twice a month during season; by Truck Crop Division.

Harvesting, dates of and per cent harvested monthly, by States. Office table 273-2.

Planting, dates of and per cent planted monthly, by States. Office table 273-2.

Price, average, for canning peas. Special report by Truck Crop Division, March 19, 1920.

Production :

For canning, usually by States. Since 1918, usually in September and October; also Yearbooks.

Pack, United States and Canada, 1905. November, 1906, p. 88.

Peppers.

Condition, by States. Since April, 1915; twice a month during season (Truck Crop Division).

Pineapples (Florida).

Condition. Since 1907, March to July.

Prices, 1st of month per crate.

Production, percentage of a full crop. Since 1907, in August.

Planting and Harvesting Periods.

Dates of planting and harvesting, by States:

Cereals. Bureau of Statistics Bul. 85. Office tables 244 and 256.

Cereals, cotton, flax, tobacco. Office table 273.

Hay and forage. Office tables 285 and 285A.

Potatoes. Office table 273-4.

Vegetables, per cent planted and harvested, by months. Office table 273-2.

Harvesting periods:

By States, percentage each month, 35 crops. September, 1920 p. 100.

United States and foreign countries:

Barley. Office table 297-2.

Oats. Office table 297-3.

Rice. Office table 273-3.

Rye. Office table 297-1.

Wheat. July, 1920, p. 71. Office tables 297 and 354.

Plowing.

Spring plowing done:

In Florida. Since 1907, usually in March.

In United States, by States. Since 1882, except 1883, usually in May.

Average depth, by States. February, 1918, p. 17.

Riding plows used by cotton growers, by States. August, 1919, p. 78.

Potatoes (Irish).

Acreage:

By States. Since 1866, usually in July; revised in December.

Early crop, by States. Since 1914, usually in April and August; revised in October. (Truck Crop Division.)

In Florida. Since 1907, usually in March.

In foreign countries. Since 1900, usually at least once a year; also Yearbook.

Condition:

By States. Since 1866, in July, August, and, except 1877-1881, in October; since 1867, in September.

Early crop, by States. Since April, 1915, usually twice a month during season. (Truck Crop Division.)

In Florida. Since 1907, monthly, March to May, inclusive.

Damage to crop:

Causes of, by States, 1909. June, 1912, p. 46.

Causes and extent, 1909-1912. June, 1913, p. 45.

Dates of planting and harvesting, by States. Office table 273-4.

Disposal of crop, per cent monthly, by States. May, 1918, p. 53.

Harvested:

Monthly, in United States, 1915-1917. November, 1917, p. 112.

Per cent monthly, by States. November, 1916, p. 116.

Per cent of early crop, monthly, January to July, by States. April, 1916, p. 36.

Loss, after harvest, late commercial crop, by States, 1919.

Price:

To producers, by States, on December 1. Since 1866, monthly since January, 1908.

Wholesale at seven United States markets. Monthly since 1891. Year-books; also office table 294-5.

Potatoes (Irish)—Continued.

Production:

By States. Since 1866, usually in November.

By months when harvested. Since 1915, usually in November.

Forecast from condition, by States. Since 1911, monthly, July to October, inclusive.

Early crop, by States. Since 1917, usually in May and August; revised in October. (Truck Crop Division.)

Late commercial crop, by States, 1918-19.

In foreign countries. Since 1900, usually at least once a year; also Yearbooks.

Quality, by States. Since 1866, except 1877-1881, 1883-84, 1890, and 1892, usually in November.

Seed requirements in United States, 1916. Office table 313-7.

Seed used per acre. June, 1913, p. 48.

Shipped out of county where grown (per cent), by States. November, 1916, p. 115.

Stocks, by States. Since 1908, usually in January.

Of late commercial crop in growers' hands. December 1, 1919.

Supply:

In United States, 1910-1915. June, 1916, p. 54.

Shortage in "world crop," by countries, 1916. March, 1917, p. 22.

Value on farms:

By States. Since 1866, usually in December.

Per acre, by States, 1914-1919. Yearbook 1919, table 96.

Yield per acre:

By States. Since 1866, usually in November. 1910-1919, Yearbook 1919, table 96.

In Florida. Since 1907, usually in June.

Largest reported. January, 1918, p. 25; August, 1918, p. 87; October, 1918, p. 128.

Late commercial crop, by States, 1918-1919.

In foreign countries. Since 1899, usually at least once a year: also Yearbooks.

Equivalent of 100 per cent (or normal) conditions. Once a year since 1911.

Potatoes (Sweet).

Acreage, by States. Since 1899, usually in July; revised in December.

Condition, by States. Since 1868 in September and, except 1877-1881, 1887, 1897, in October; since 1869, except 1898, in July; since 1869, except 1888, in August.

Damage, annual losses from disease, 1884-1918. April, 1918, p. 41 (chart).

Plants used per acre. June, 1913, p. 48.

Price:

To producers, by States, on December 1 since 1868, except 1876-1878, 1881, 1892-1893 and 1878.

To producers, by States. Monthly since June, 1914.

To producers, in United States. Monthly since 1908, office table 293-6; also Yearbooks.

Wholesale at four United States markets. Monthly since 1891.

Production, by States. Since 1900, usually in November.

Quality, by States. Since 1868, except 1877-1881, 1883, 1887, and 1890-1894, usually in November.

Potatoes (Sweet)—Continued.

Seed requirements, in United States, 1916. Office table 313-8.

Value on farms:

By States. Since 1868, except 1876-1878, 1881, 1892-1893, and 1898, usually in December.

Per acre, by States, 1914-1919. Yearbook 1919, table 105.

Per acre, in United States, 1899, 1909, 1913, and 1914. December, 1914, p. 23.

Yield per acre:

By States. Since 1868, except 1876-1877 and 1881, usually in November.

By States, 1910-1919. Yearbook 1919, table 105.

Largest reported, by States and counties, 1910. January, 1918, p. 2.

Poultry.

Receipts, monthly, at specified markets, 1909. May, 1910, and monthly.

Prices:

Chickens:

Farm, United States by States, 1st of month. February, 1909; March, 1909, and monthly. Office table 293-13.

Average monthly farm, 1908 and 1909. Yearbook 1909, p. 604.

On the 15th of month since July, 1912. Office table 293-61;

Farmers' Bulletin 645, p. 43, continuing monthly.

Turkeys, on the 15th of month since October, 1912. Office table 293-62;

Farmers' Bulletin 641, p. 38.

Prices.

Articles bought by farmers:

About 88 articles. Yearly since 1913, usually in March or April.

Alfalfa seed, clover seed, timothy seed, 15th each month. Since 1912.

Cottonseed hulls, 15th of each month. Since 1915.

Bran, cottonseed meal, 15th of each month. Since 1910.

Average to producer for 10 crops, 1908-1917. December, 1917, p. 128.

Compared with production, 1908-1917. November, 1917, p. 112.

Compared with wages and land values. April, 1918, p. 37.

Farm and retail compared, 1913-1918. September, 1918, pp. 112-113.

Farm price and yield per acre combined, 1866-1915. February, 1917, p. 16 (chart).

Geographic phases, wheat, corn, and oats, 1910-1914. Tables and maps, Department Bulletins Nos. 594, 696, 755.

Live stock on farms, January 1. Since 1867 each year. (See each class separately.)

Monthly variation. October, 1915, p. 60 (chart).

Sources of wholesale prices, at United States markets. Office table 342-1.

To producers:

December 1:

Since 1866, barley, buckwheat, corn, hay, oats, potatoes, rye, tobacco, wheat.

Since 1868, sweet potatoes.

Since 1876, cotton.

Since 1900, rice.

Since 1910, apples.

Since 1902, flaxseed, sorghum sirup.

Since 1911, sugar beets.

Since 1914, beans, cranberries.

Since 1915, grain sorghums, hemp, hops.

Since 1867, cattle, milk cows, horses, mules, sheep, swine.

Prices—Continued.

To producers—Continued.

First of each month:

Since 1908, barley, buckwheat, corn, cotton, flaxseed, grapefruit, hay, limes, oats, oranges, potatoes, rye, wheat.

Since 1909, butter, chickens, eggs.

Since 1911, lemons.

Since 1914, sweet potatoes.

Since 1916, apples, rice.

Fifteenth of each month:

Since 1910, apples, beans, broom corn, cabbage, clover seed, cotton seed, grapes, honey, hops, milk, onions, peaches, peanuts, pears, timothy seed.

Since 1912, alfalfa seed, chickens, eggs, hickory nuts, maple sirup, maple sugar, popcorn, tomatoes, turnips, turkeys, walnuts (black).

Since 1913, soy beans.

Since 1914, alfalfa, chestnuts, clover hay, pecans, timothy hay, wild hay.

Since 1915, cowpeas.

Since 1916, grain sorghums.

Wholesale, of farm products, at United States markets, barley, beans, butter, cattle, clover seed, coffee, corn, cotton, eggs, flaxseed, flour (wheat), hay, hogs (live), hops, horses, oats, potatoes, rice, rye, sheep, sugar, sweet potatoes, tea, timothy seed, tobacco, wheat, wool. Yearbooks, Office tables 294 to 294-26.

Production.

(For further details see each crop.)

Animals and animal products (see each chart).

Compared with railway tonnage. July, 1918, p. 78.

Crops, by States:

Since 1866, barley, buckwheat, corn, cotton, hay, oats, potatoes, rye, tobacco, wheat.

Since 1890, spring and winter wheat separately; also apples.

Since 1900, peaches, sweet potatoes.

Since 1901, sugar beets, beet sugar.

Since 1902, flaxseed.

Since 1904, rice.

Since 1910, pears, sorghum sirup.

Since 1912, clover and wild hay, Louisiana cane sugar.

Since 1914, beans (5 States), cranberries (3 States), truck crops.

Since 1915, broom corn (5 States), alfalfa, clover, millet, and timothy hay, hemp (2 States), hops (4 States), grain sorghums (6 States), orange (2 States).

Since 1916, peanuts, soybeans, apples (commercial).

Since 1917, maple sugar and sirup, peaches (commercial), pears (commercial).

Since 1918, cane sirup.

Crops, machinery required for. July, 1918, p. 71.

Crops, compared with population, 1881-1915. April, 1917, p. 34.

Cost of production:

Minnesota. Bureau Statistics bulletins 48, 73.

Production—Continued.

Cost of production—Continued.

United States. Barley (October, 1911), corn (April, 1911), cotton (November, 1914, Div. Stat. Bul. No. 16), oats (June, 1911), potatoes (November, 1911), wheat (May, 1911).

Cost of raising horses. April, 1913.

Important crops in leading 5 States, 1913–1919. April, 1916, p. 34; April, 1919, pp. 40–41; April, 1920, p. 37.

Increase in, compared with population, 1881–1915. April, 1917, p. 34.

In foreign countries:

Barley, beans, corn, cotton, flax fiber and seed, hops, oats, peas, potatoes, rice, rye, silk, sugar, sugar beets, tobacco, wheat. Yearbooks.

All crops for all years reported. Files of Division of Crops Records.

Current data, Foreign Crop and Live Stock Reports, semi-monthly since March, 1919.

Leading crops, United States and world compared. February, 1917, p. 15.

Per man per acre, United States and foreign countries. July, 1918, p. 78.

Staple crops in leading States, 1916–1918. July, 1918, p. 81.

Trend compared with population, 1866–1919. April, 1920, p. 35 (chart).

Value of, 1879 to 1919. January, 1920, p. 1.

Production, as a Percentage of a Full Crop.

(For further details, see each crop.)

Annually:

Since 1886, apples, clover hay, grapes, pears, sugar cane.

Since 1867, peaches.

Since 1906, alfalfa hay, blackberries, broom corn, cabbage, cantaloupes, clover seed, field beans, field peas, hemp, grain sorghums, lemons, millet, onions, peanuts, raspberries, strawberries, sugar beets, tomatoes, watermelons.

Since 1907, grapefruit, lima beans, limes, pineapples.

Since 1911, almonds, apricots, olives, prunes, walnuts.

Since 1912, alfalfa seed, cauliflower, celery.

Since 1914, timothy hay.

Production, Quality of.

(For further details see each crop.)

Annually:

Since 1866, barley, corn, hay, oats, potatoes, rye, tobacco, wheat.

Since 1868, sweet potatoes.

Since 1877, clover hay.

Since 1882, buckwheat, hops.

Since 1903, flaxseed.

Since 1908, rice.

Since 1909, apples.

Since 1910, cranberries, grapes, oranges, peanuts, pears.

Since 1911, lemons.

Since 1912, grapefruit, peaches.

Since 1914, wild hay.

Since 1915, limes, maple sugar and sirup.

Prunes (California).

Condition. Since 1911, June to September.

Production, percentage of a full crop. Since 1911, in October.

Rice.

Acreage :

By States. Since 1904, usually in June; revised in December.

By States, and varieties, 1916-1918. September, 1918, p. 109.

In foreign countries. Since 1900 at least once a year; also in Yearbooks 1900-1918, Yearbook 1919, Table 81.

Condition, by States. Since 1894, July, August, September, October; except 1898-1901.

Consumption :

In brewing, 1916 to 1918. November, 1918, p. 135.

Per capita in United States and foreign countries, 1902-1911. October, 1918, p. 124; 1909-1913 and 1914-1918, Yearbook 1918, Table 88.

Damage to crops, causes of, by States, since 1909. June, 1912, pp. 46 and 48.

Dates of sowing and harvesting, United States and foreign countries. Office table 273-3.

Harvesting, per cent monthly for United States. October, 1919, p. 104.

Prices, to producers :

By States, December 1, since 1900. January, June, July, November, since 1916.

Wholesale, at five United States markets. January, June, July, November, December, since 1901; office Table 294-13; also Yearbook.

Production :

By States. Since 1904, usually in December.

Forecast from conditions, by States. Since 1911, July, August, September, October.

Foreign countries. Since 1900, usually once a year or oftener; also Yearbooks.

United States, 1718-1911. Bureau Statistics circular 34.

Quality, by States. Since 1908, usually in December.

Value on farms, by States. Since 1904, usually in December.

Varieties, per cent of crop, etc., by States. December, 1918, p. 147; January, 1920, p. 4.

Weight per bag, by States. December, 1918, p. 147; January, 1920, p. 4.

Yield per acre :

By States. Since 1895, usually in December, except 1897.

Annual changes in United States since 1904. January, 1919, p. 3.

Equivalent of 100 per cent (or normal) condition. Once a year since 1911.

Rye.

Acreage harvested :

By States. Since 1866, usually in May, revised in December.

Planted in fall, by States. Since 1899, usually in December; revised following spring.

In foreign countries, Yearbooks since 1905.

Condition, by States. Since 1866 in June, July, December; since 1879 in April; since 1882 in May.

Consumption :

By classes of live stock. August, 1919, p. 77.

Monthly on farms. June, 1919, p. 57.

Per capita of population, United States and foreign countries. 1902-1911, October, 1918, p. 124; 1909-1913 and 1914-1918, Yearbook 1919, Table 88.

Dates of sowing and harvesting in foreign countries. Office table 297-1.

Rye—Continued.

Harvesting:

Dates of, for United States. October, 1919, p. 104.

Methods of. February, 1917, p. 14.

Planting, dates of, for United States. Bureau Statistics Bulletin 85.

Prices:

To producers, by States. December 1, since 1866; monthly since January, 1908.

Wholesale, at five United States markets. Monthly since 1895; office table 294-4; also Yearbooks.

Production:

By States. Since 1866, usually in August; revised in December.

Forecast from condition, by States. Since 1912, April to July, inclusive; office table 350.

In foreign countries. Since 1895, usually once a year or oftener; also Yearbooks.

Quality, by States. Since 1866, usually in October, except 1877-1881, 1885, 1890-1, 1893.

Seed (used per acre):

In foreign countries. April, 1915, p. 11.

In United States. June, 1913, p. 48; office table 313-5.

Stocks on farms, relative stocks. January 1, 1917 and 1918; May, 1918, p. 52.

Value on farms, by States. Since 1866, usually in December.

Yield per acre:

By States. Since 1866, usually in August; revised in December.

Annual changes since 1866. January, 1919, p. 3.

Equivalent to 100 per cent (or normal) condition. Since 1911, once a year.

In foreign countries since 1894. Office table 312-2; also Yearbooks.

Largest reported. August, 1916, p. 76; January, 1918, p. 2.

Seed.

Used per acre, principal crops. January, 1912, p. 6; June, 1913, p. 48.

Office tables 313-1 to 313-10.

Sheep.

Breeds, by States, reported by live-stock reporters in each State, United States, 1918 compared with 5 and 10 years ago. April, 1918, p. 40.

Losses, yearly, year ending March 31, since 1884 (1915 missing); condition, April 1, since 1889 (1898 and 1902 missing). Report 109, and yearly in April since 1903.

Number:

Average price and total value, United States, by States. January 1, since 1867; yearly in February since 1904; Yearbook.

World, office table 262; Report 109; Yearbook.

In six principal wool-producing countries of world. Office table 403-1.

In countries from which data are obtainable. Chart, February, 1910, p. 13.

On farms, by geographic divisions in United States, from 1840. Office table 358; report 109.

On farms, January 1, five-year averages, 1852-1856, 1912-1916, and each year 1911-1919. Office table 359.

Of sheep and lambs slaughtered at principal places, 1884-1914. Report 109, p. 307.

Sheep—Continued.

Per cent of United States sheep in each State. July, 1908, p. 53.

Prices :

Per 100 pounds, United States, by States, 15th of month. December 15, 1909, to date, monthly, since January, 1910.

Monthly trend, per 100 pounds to producers, average, 1910-1914. Chart, July 15, 1915, p. 8.

By ages or classes, 1911-1917. January, 1917, p. 11, and following in February, yearly.

Wholesale, on prominent markets of specified countries in specified years. Report 109; Yearbook; office table 294-23.

Receipts :

Yearly, on specified markets, 1900 to date. February, 1911, and yearly in February; Yearbook. Office table 249. On some markets since about 1869: Report of statistician.

Monthly, on specified markets, 1911-1913. June, 1913, p. 45, and following in June; office table 84.

Value,¹ aggregate, United States, by States, comparisons, 1917, 1918, and average 1912-1916. February, 1918, p. 16, and following yearly in February.

Shipments Out of County Where Grown.

(For further details see each crop.)

Apples, since 1914.

Barley, since 1910.

Corn, since 1883.

Oats, since 1897.

Wheat, since 1883.

Silk.

Production, world, 1900-1914. May, 1915, p. 6, and following in May for several years; Yearbook for earlier years; also 1918, p. 585.

Silos.

Corn for. (See *Corn*.)

Number and capacity, by States. August, 1917, p. 72.

Number :

In Kansas, 1914-1917. May, 1918, p. 53.

In Wisconsin and Ohio, 1917-1918. March, 1919, p. 27.

In Indiana, 1912, 1914, 1915. October, 1915, p. 59.

Soy Beans.

Acreage :

By States. Since 1917, usually in December.

For forage. By States, 1918-1919. February, 1920, p. 11.

For grain. By States, 1917-1919. February, 1920, p. 12.

Harvested for hay, grain, hogged off, etc., 1917. May, 1918, p. 49.

Planted with other crops, 1917. May, 1918, p. 49.

Prices, to producers, by States. Monthly since October, 1913.

Consumption, for various purposes, by States. February, 1916, pp. 18-19.

Dates of planting and harvesting, by States. February, 1916, pp. 18-19.

Production :

By States. Since 1917, usually in December.

Of grains, by States, 1917-1919. February, 1920, p. 12.

¹ Includes cattle and hogs.

Soy Beans—Continued.

Seed used per acre, United States. June, 1913, p. 48.

Value on farms, United States, 1917–1919. Usually in December.

Yield per acre:

By States. Since 1917, usually in December.

For forage, by States, 1918–1919. February, 1920, p. 11.

For grain, by States, 1917–1919. February, 1920, p. 12.

Spinach.

Condition, by States. Since April, 1915, twice a month during season (Truck Crop Division).

Stocks on Farms.

Wheat. Since 1883 in March, since 1895 in July.

Corn. Since 1883 in March, since 1896 in November.

Oats. Since 1895 in August, since 1897 in March.

Barley. Since 1910, in March and August.

Potatoes. Since 1908, in January.

Hay. Since 1909, in May.

Straw.

Production, uses, varieties. May, 1915, p. 5.

Strawberries.

Acreage:

By States, 1915 and 1916. May, 1916, p. 42.

1916 and 1917, five States. April, 1917, p. 33.

And production, commercial. May, 1917, p. 39; June, 1918, p. 64.

Condition (Florida). Since 1907, in April and May.

Florida crop. January, 1920, p. 4.

Per cent harvested each month, December to July, by States. April, 1917, p. 33; by States with included counties, May, 1916, p. 42; also office table 273–2.

Production:

Compared with a full crop, by States. Since 1906, in July.

Compared with average. Since 1910, usually in November.

Commercial, by States. June, 1917, p. 49.

Sugar and Sugar Crops.

All sugar.

Consumption:

Per capita, in United States, since 1901. Yearbook 1919, Table 197.

Per capita, on farms in Wisconsin, 1918. August, 1918, p. 89.

In foreign countries, 1915–1919. Office table 378–3.

Per capita, in foreign countries, 1909–1913. Office tables 324, 384.

Price, wholesale:

By months, at New York, since 1883 and at New Orleans since 1891.

Office table 294–16; also Yearbooks.

Supply, for United States, since 1901. Yearbook 1919, Table 197, also office table 319, 378–2.

Beet sugar.

Factories in operation:

In United States. Since 1901, usually in December and April; also Yearbooks.

In foreign countries, since 1910.

Length of campaign, by States. Since 1902, usually in April.

Sugar and Sugar Crops—Continued.*Beet sugar—Continued.*

Production :

By States. Since 1901, usually in December ; revised in April.

In foreign countries, since 1895. Usually once a year or oftener.

In foreign countries, per ton of beets, since 1910. Yearbooks.

Sucrose :

In beets. Since 1901, usually in December ; revised in April.

Loss in extraction. Since 1901, usually in December ; revised in April.

Obtained in manufacturing. Since 1901, usually in December ; revised in April.

Purity coefficient. Since 1902, usually in April.

Cane sugar, sirup, and molasses.

Mills :

In Louisiana, those of 1845 and 1913 compared. May, 1916, p. 145.

Operating in Louisiana, by parishes (counties). Since 1913, usually in April or May.

Operating in foreign countries. Since 1910, Yearbooks.

Operating in Hawaii, by islands. Since 1913.

Length of campaign :

In Louisiana. Since 1913, usually in April or May.

In Hawaii. Since 1913.

Production :

Of sugar—

In Louisiana, by parishes (counties). Since 1913, usually in April or May ; forecast in December.

In Louisiana, per ton of cane. Since 1913, usually in April or May.

In Texas. Since 1918, usually in December.

In Hawaii. Since, 1913.

In Hawaii, per ton of cane. Since 1913.

In foreign countries. Since 1895. Yearbooks.

In foreign countries, per ton of cane. Since 1910, Yearbooks.

Of sirup, by States. Since 1918, usually in December.

Of molasses (reported with sugar).

Maple sugar and sirup.

Number of trees tapped :

By States. Since 1917, usually in May.

In Vermont, 1909–1914. April, 1916, p. 29.

Price, by States. Since March, 1912 ; monthly, February to June, inclusive.

Producing regions of United States. June, 1918, p. 61.

Production :

By States. Since 1917, usually in May.

Per tree, by States. Since 1917, usually in May.

In Vermont, 1909–1914. April, 1916, p. 29.

Quality, by States. Since 1914, usually in May.

Sugar beets.

Acreage :

Abandoned, 1914–17. July, 1918, p. 76.

Harvested, by States. Since 1901, usually in December ; revised in April.

Planted, by States. Since 1901, usually in July.

In foreign countries. Since 1912, Yearbooks.

Condition, by States. Since 1906, monthly, June to November, inclusive.

Prices to producers, by States. Since 1911, usually in July, December, and April.

Sugar and Sugar Crops—Continued.*Sugar beets—Continued.***Production:**

By States. Since 1901, in December and April.

Forecast from condition by States. Since 1906, monthly, June to November, inclusive.

Per cent of full crop, by States. Since 1906, usually in December.

In foreign countries. Since 1912, Yearbooks.

Seed produced in United States. Since 1916, usually in November.

Seed used per acre, in United States. June, 1913, p. 48.

Sliced for sugar, by States. Since 1901; in December and April; also Yearbooks.

Yield per acre, by States. Since 1901, usually in December; revised in April.

*Sugar cane.***Acreage:**

Total, by States. Since 1918, usually in July; revised in December.

For sirup, by States. Since 1918, July and December.

Of plant and stubble cane in Louisiana. May, 1918, p. 51.

In Louisiana, for sugar. Since 1913, usually in April or May; forecast in December.

In Texas, for sugar. Since 1918, usually in December.

In Hawaii, harvested and total, by islands. Since 1912.

Per cent of preceding year. Since 1866, usually in June.

In foreign countries. Since 1910; usually once a year or oftener.

Condition:

Since 1866, in August; since 1867 in September; since 1867, except 1877-1881.

In October. Since 1867, except 1880-1901, in July; since 1906 in June and November.

Production:

In Louisiana, for sugar. Since 1911, usually in April or May; also Yearbooks.

In Texas, for sugar. Since 1918, usually in December.

In Hawaii. Since 1913. Once a year.

Per cent of full crop, by States. Since 1866, except 1877-1881, 1884-85, and 1887-1897, usually in December.

In foreign countries. Since 1910, usually once a year or oftener.

Yield per acre:

In Louisiana, for sugar. Since 1911, usually in April or May.

In foreign countries. Since 1910; also Yearbooks.

Sorghum (for sirup) and sorghum sirup.

Acreage, per cent of preceding year. Since 1866, except 1889, 1898-1901, and 1904-5, usually in July.

Condition. Since 1866, except 1898-1901 and 1894-95, in July; since 1866-67, except 1901 and 1904-5, in August and September; since 1866, except 1877-1881, 1901-2, and 1904-5, in October.

Prices of sirup, to producers, by States, on December 1. Since 1902, except 1904-5, 1915, and 1916.

Production of sirup, by States. Since 1902, except 1904-5 and 1915-16, usually in December.

Value of sirup on farms, by States, on December 1. Since 1902, except 1904-5 and 1915-16.

Yield of sirup per acre, by States. Since 1866, except 1876-77, 1881, 1897, 1899, 1900-1902, and 1904-5, usually in November.

Swine.

Birth rate, monthly. February, 1913, p. 14.

Industry, changes in, 1920 compared with 1919. July,¹ 1920, p. 69; also September, 1919, p. 92.

Losses, yearly:

Year ending March 31. Since 1884 (1915 missing). Condition since 1889 (1898 and 1902 missing), United States, by States. Since April, 1903, and following, usually in April; report 109.

Per 1,000, 1884-1918. Chart, April, 1918, p. 41.

Number:

World: Yearbook; Report 109. Office table 262.

Average price and total value, January 1, each year, since 1867. Annually in February since 1904. Yearbook.

On farms, January 1, averages 1852-1856 to 1912-1916 and each year 1911-1919. Office table 359.

On farms, by geographic divisions since 1840. Report 109 and office table 358.

In foreign countries, recent years, by countries. Office table 403-2.

Average annual, in United States, 1899-1908. February, 1910, pp. 12-13.

Born in month, slaughtered in month, and total on hand, average, 1910-1915. January, 1916, p. 11; chart.

Slaughtered at principal places, 1872-1914. Report 109, p. 367.

Of stock hogs and condition, since 1867. Yearly since September, 1900.

Breeding sows, since 1894. Yearly in April since 1903.

Percentage slaughtered on farms, each month, in a normal year. June, 1916, p. 59.

Proportion of total belonging to different breeds in the United States, by States. June, 1920, p. 53.

Prices:

Farm, per 100 pounds, on 15th of month, United States, by States. Since December 15, 1909; monthly since January, 1910.

Wholesale, range of, on specified markets, monthly since 1895. Since June, 1899 (United States, mostly Chicago).

Wholesale, on specified markets in certain countries in specified years. Report 109; Yearbook; office table 294-25.

Monthly trend to producers per 100 pounds, average, 1910-1914. Chart, July 15, 1915, p. 8.

Receipts:

Yearly, on specified markets. Since 1900, February, 1911, p. 12, and yearly in February. On some markets, since about 1869. Report of Statistician.

Monthly, on specified markets. June, 1913, p. 45, and following in June.

Value,¹ aggregate, United States, by States, comparisons, 1917, 1918, and average, 1912-1916. February, 1918, p. 16, and following yearly in February.

othy (Hay).

Acreage, per cent of United States total grown in each State. July, 1908, p. 52.

¹ Includes cattle and sheep.

Timothy (Hay)—Continued.

Condition, by States. Since 1866 in August; since 1867 in July; September, 1914, p. 27 (Farmers' Bulletin 620).

Prices to producers, by States. Monthly since May, 1914; also office table 293-49.

Production:

By States. Since 1915, usually in December.

Per cent of full crop, by States. Since 1914, usually in September.

Of timothy and clover. Since 1915, usually in December.

Seed used per acre, in United States. June, 1913, p. 48.

Yield per acre, by States, 1918. January, 1919, p. 2.

Timothy (Seed).

Acreage harvested, by States, 1909. Office table 180 (Thirteenth Census data).

Prices:

To producers, by States. Monthly since September, 1910; also office table 293-54.

Paid to farmers, by States. Monthly since June, 1912; also office table 293-65.

Wholesale, at United States markets. Monthly since 1896. Office table 294-9.

Production, by States, 1909. Office tables 208 and 180 (Thirteenth Census data).

Tobacco.**Acreage:**

By States. Since 1866, except 1877, 1897-98, usually in July; revised in December.

By certain States and counties, 1879, 1889, 1899, 1909, 1919. Office table 375.

By types and districts. Since 1910, usually in July; revised in December.

In United States. Since 1863, except 1897-98; also certain earlier years (Bureau Statistics Circular 33).

In foreign countries. Yearbooks, since 1905.

Condition:

By States. Since 1867 in July and September; since 1866 in August; since 1866, except in 1877-1881, in October.

By types and districts. Since 1908 in July.

Damage to crop:

By States, 1909. June, 1912, p. 46.

Causes and extent, 1909-1912. June, 1913, p. 45.

Exports from the Thirteen Colonies to England, 1698-1699. March, 1909 p. 24.

Planting dates, by States. May, 1912, p. 35.

Plants used per acre. June, 1913, p. 48.

Prices:**To producers—**

By States, on December 1. Since 1866, except 1877 and 1897-98.

By States, 15th of each month since 1910. Office table 293-63.

By types and districts, on December 1. Since 1909.

By States, 1st of each month since June, 1916. Office table 293-

Wholesale, at six United States markets, monthly since 1907. Of table 294-11.

Tobacco—Continued.

Prices—Continued.

In United States. Since 1863, except 1877, 1897–98; also certain earlier years (Bureau Statistics Circular 33).

Production:

By States. Since 1866, except 1877 and 1897–98, usually in November.

By types and districts. Since 1909, usually in July; revised in December.

Forecast from condition, by States. Since 1911, monthly July to October.

In United States, since 1863, with certain years since 1618 (Bureau Statistics Circular 33).

In foreign countries. Yearbooks.

Quality, by States. Since 1866, except 1877–1881, 1883, 1890, and 1892, usually in November.

Sales by farmers, by States, districts, and counties, since 1908–09. Office table 123, A, B, C, etc.

Seed requirements (plants) in United States, 1916. Office table 313–10.

Value on farms:

By States. Since 1866, except 1877 and 1897–98, usually in December.

By types and districts. Since 1909, usually in December.

Per acre, by States. Since 1866, except 1877 and 1897–98, usually in December.

Yield per acre:

By States. Since 1866, except 1877, usually in November.

By types and districts. Since 1909, usually in December.

Equivalent of 100 per cent (or normal) conditions. Since 1911, once a year.

Largest reported, by States and counties, 1916. January, 1918, p. 2.

Tomatoes.

Acreage:

By States. Since January, 1918, usually in May and August (Truck Crop Division).

Canning crop, by States. Since June, 1915, usually in September and October (Truck Crop Division).

Commercial, by States, 1915–16. December, 1916, p. 136.

Canning crop, by States, 1913–1918. February, 1916, p. 17; December, 1916, p. 122; August, 1917, p. 76; September, 1918, p. 109; February, 1919, p. 2.

Per cent grown in each State. October, 1908, p. 76.

Condition:

By States. Since 1906. July, August, September.

In Florida. Since 1912, March, April, May.

By States. Since April, 1915, twice a month during season (Truck Crop Division).

Canning crop, by States. Since August, 1916, twice a month during season (Truck Crop Division).

Dates of planting and harvest, by States. Office table 273–2.

Pack:

By States, 1917 and 1918. November, 1918, p. 138.

United States and Canada. January, 1906, p. 84; December, 1904, p. 65; December, 1902, p. 3; January, 1901, p. 7.

Prices, to producers. Since 1912, monthly, July to October, inclusive.

Tomatoes—Continued.

Production:

By States. Since January, 1918, usually in August (Truck Crop Division).

By States, 1914. October, 1914, p. 26.

Canning crop, by States. Since January, 1918, usually in September and October (Truck Crop Division).

Commercial, by States, 1915-16. December, 1916, p. 136.

Percentage of full crop, by States. Since 1906, usually in October.

Special report, price and value of canning crop, March 20, 1920. On file (Truck Crop Division).

Yield per acre, by States. 1914. October, 1914, p. 26.

Tractors (on Farms).

In commission, by States. April, 1917, p. 33.

Number:

In Ohio. March, 1919, p. 25.

In Kansas. May, 1918, p. 53.

On hand in United States, December 31, 1917, by power classes, sold, manufactured, exported, etc., in 1918. Office table 366.

Truck Crops.

Acreage and production (Truck Crop Division):

Since 1914, cabbage, onions.

Since 1915, cantaloupes, sweet corn, tomatoes, watermelons.

Since 1916, Bermuda onions, early potatoes, strawberries.

Since 1917, cabbage for kraut.

Since 1918, celery, cucumbers for pickles.

Since 1919, lettuce.

Frosted in Florida in February, 1917. March, 1917, p. 24.

Garden movement. May, 1900, p. 5.

Prices, since 1920. Snap beans, cabbage, sweet corn, cucumbers, onions, peas, strawberries, tomatoes.

Truck farming in North Carolina. May, 1908, p. 40.

Turnips.

Condition, by States. Since April, 1915; twice a month during season (Truck Crop Division).

Prices to producers. Since 1912; monthly, November to February, inclusive.

Values.

Farm products, 1879 to 1919. January, 1920, p. 1; since 1913, office table 296.

Farm animals (and products), 1897 to 1919. January, 1920, p. 1.

Farm crops:

1897 to 1919. January, 1920, p. 1.

Aggregate, by States. Since 1909, usually in December.

In international trade.

Relative rank, by States and crops, 1910-1914, and 1918. February, 1919, p. 17.

Velvet Beans.

Acreage:

By States. Since 1917, usually in December.

For grain, forage, etc., by States, 1917-1919. February, 1920, p. 10.

Harvested for grain, hay, hogged off, etc., 1917. May, 1918, p. 49.

Velvet Beans—Continued.

Comments, general discussion, etc. October, 1917, p. 100.

Consumption for various purposes, by States. February, 1916, p. 19.

Dates of planting and harvesting, by States. February, 1916, p. 19.

Prices to producers, by States. Since 1913, usually in February and October.

Production by States. Since 1917, usually in December; 1917–1919, February, 1920, p. 10.

Yield per acre, by States. Since 1917, usually in December; 1917–1919, February, 1920, p. 10.

Wages.

See labor on farms, wages of.

Watermelons.**Acreage:**

Commercial preliminary estimate, by States. June, 1917, p. 51.

Commercial, by States, 1917 and 1918. July, 1918, p. 79.

1915 and 1916, by States, with included counties. August, 1916, p. 80;
June, 1916, p. 53.

Condition:

By States. Since 1906, in June, July, August, and September.

In Florida. Since 1906, May to August.

In California. Since 1906, June, July, and August.

Harvested (April to October), by States. June, 1916, p. 53; June, 1917, p. 51.

Production:

Percentage of a full crop, by States. Since 1906, usually in October.

Compared with average, United States. 1910, in November.

Weight Per Measured Bushel.

For further details, see each crop.

Barley, since 1910.

Oats, since 1897.

Wheat (all), since 1884.

Spring and winter wheat separately, since 1899.

Wheat (All).**Acreage:**

Harvested by States. Since 1866.

In foreign countries. Since 1891, Yearbooks 1917–1919; January, 1920, p. 3.

Condition, by States. Since 1867, in September. (See Wheat, spring and winter.)

Consumption:

By classes of live stock, for certain States, 1915 crop. April, 1916, p. 32; 1917 crop, March, 1918, p. 28.

By classes of live stock, for United States, 1918. August, 1919, p. 77.

Monthly, on farms. June, 1919, p. 57.

Per capita of population, by States. October, 1913, p. 123.

Per capita of population, United States and foreign countries. 1902–1911, October, 1918, p. 124; 1909–1913 and 1914–1918, Yearbook 1919, Table 88.

Damage to crop:

Causes of, by States, 1909. June, 1912, p. 46.

Causes and extent of, 1911. July, 1912, p. 48.

Wheat (All)—Continued.

Dates:

Of sowing and harvesting in different countries. Office Tables 297 and 354.

Of harvesting in different countries. July, 1920, p. 71.

Harvesting:

Harvest period, by States. June, 1915, p. 5; Bureau Statistics Bulletin 85.

Per cent monthly, for United States. October, 1919, p. 104.

Methods of, by States. February, 1917, p. 14.

Marketed, monthly from farms, for United States, since 1907. March, 1917, p. 23; October, 1919, p. 99.

Planting, dates of, by States. (See Wheat, spring and winter.)

Prices:

Geographic phases, 1911-1914; Department Bulletin 594.

To producers, by States, on December 1. Since 1866; monthly since January, 1908.

To producers, average for each crop, 1913-1916. August, 1917, p. 75.

On farm, compared with retail price of flour, 1913-1918. September, 1918, pp. 112 and 113 (chart).

Of flour, wholesale, at four United States markets. Monthly since 1907; Office table 294-26; Yearbooks.

Foreign countries (Government price), 1919. Office table 381.

United States Government. September, 1917, p. 82; July, 1918, pp. 78 and 81.

War-time prices, United States and foreign, 1913-1918. August, 1919, p. 77.

Wholesale, at United States markets. Monthly since 1858; office table 294-1; Yearbooks.

In United States, 1790-1840. Office table 344.

Production:

By States. Since 1866, usually in October; revised in December.

Cost of, by States, 1909. May, 1911, p. 36.

Forecast from condition, by States. Since 1911, monthly, July to September, inclusive.

In foreign countries. Usually once a year, or oftener, since 1891; 1917-1919, January, 1920, p. 3; 1909-1919; Office table 325-1.

Quality, by States. Since 1866, usually in October.

Seed:

Quantity normally required by States; October, 1918, p. 123.

Used per acre in United States. June, 1913, p. 48.

Used per acre in foreign countries. April, 1915, p. 11.

Shipments out of country where grown, by States. Since 1883, usually in March.

Stocks:

In country mills and elevators. Since 1916, in March.

On farms, by States. Since 1883, in March, and since 1895, in July.

On farms, relative stocks, January 1, 1917 and 1918. May, 1918, p. 52.

Supply and distribution:

Since 1902. March, 1920, p. 26.

Per capita of population, 1900-1916. November, 1916, p. 112.

Surplus and deficiency, by States, 1909-1913 average, 1917, and 1918, October, 1918, p. 123; 1910-1914 average, 1915, and 1916, November, 1916, p. 115.

Wheat (All)—Continued.**Transportation:**

Freight rates over various routes, 1881–1915. Office table 259 A.

Hauling by wagon and motor truck, 1906 and 1918. October, 1918, p. 125.

Ocean freight rates 1913–1916. March, 1916, p. 26.

Value on farms, by States. Since 1866, usually in December.

Weight per measured bushel, by States. Since 1884, usually in November.

Yield per acre:

By States. Since 1885, usually in December.

Liquidivalent of 100 per cent (or normal) condition. Once a year since 1911.

In foreign countries. Since 1890. Office table 312–1; also Yearbooks; 1890–1915, October, 1918, p. 127.

Largest reported in United States. July, 1918, p. 70.

Wheat (Spring).

(Excluding items included under "Wheat (all)".)

Acreage, by States. Since 1890, usually in June; revised in December.

Condition, by States. Since 1866, in June and July; since 1869, in August; since 1890, in September.

Damage to crop by black rust in Minnesota and the Dakotas. November, 1916, p. 114.

Harvest, dates of, by States. June, 1915, p. 5.

Planting, dates of, by States. May, 1912, p. 35.

Prices, by varieties in Minnesota and the Dakotas, 1916. June, 1917, p. 48.

(For other prices, see Wheat (all).)

Production:

By States. Since 1890, usually in October; revised in December.

Of durum, 1913–1914–1915. April, 1916, p. 39.

Forecast from condition, by States. Since 1911, monthly, June to September, inclusive.

Quality, by States. Since 1899, usually in October.

Value per acre, by States. June, 1917, p. 48.

Varieties, per cent of total, by States, 1914–1919. June, 1920, p. 56.

Weight per measured bushel, by States. Since 1899, usually in November.

Yield per acre:

By States. Since 1890, usually in October; revised in December.

Annual changes in United States. Since 1890. January, 1919, p. 3.

By varieties, 1914–1919. June, 1920, p. 56.

Wheat (Winter).

(Excluding items included under "Wheat (all)".)

Acreage:

Abandoned, by States. Since 1897, usually in May.

Harvested, by States. Since 1866, usually final estimate in December; since 1897, preliminary estimate in May.

Planted in fall, by States. 1886, 1890, and since 1894, usually in December and revised in spring since 1897.

Planted compared with harvested, for United States, 1886 to 1918. July, 1918, p. 76.

Sown with clover. January, 1919, p. 2.

Condition, by States. Since 1866, in December, June, July; since 1879 in April, and since 1882 in May; excepting 1876–1878, 1881, 1885, and 1897.

Wheat (Winter)—Continued.

Harvesting, dates of, by States. June 1915, p. 5; Bureau of Statistics Bulletin 85.

Planting, dates of, by States. January, 1912, pp. 4-5; Bureau of Statistics Bulletin 85.

Production:

By States. Since 1890, usually in August, revised in December.

Forecast from condition, by States. Since 1911, monthly, May to September, inclusive.

Quality, by States. Since 1907, usually in August.

Threshed, to August and September 1, 1915. August, 1915, p. 36; September, 1915, p. 47.

Weight per measured bushel, by States. Since 1899, usually in November.

Yield per acre:

By States. Since 1890, usually in August; revised in December.

Annual changes in United States. Since 1895, January, 1919, p. 3.

Largest reported in United States. January, 1918, p. 2.

Wool.**Prices:**

Farm, 15th of month, by States, since December, 1909. Also office tables 293-26 and 293-27.

Wholesale, range of, on specified markets, since 1895. Yearbook; office table 294-24.

Production:

Number of fleeces, weight per fleece, 1914 and 1915. January, 1916, p. 8; 1894-1914 (total) and 1915-1916 by States, February, 1917, p. 15, and following in February, 1918.

Pulled wool, 1918 and 1919. February, 1920, p. 17.

Weight per fleece, by States, United States, since 1900. July.

Yield per Acre.**By counties:**

In four central States and United States (cereals, potatoes, tobacco, flaxseed), 1916. Office table 314.

All States, principal crops, 1911-1919. Files of Division of Crop Records.

Changes, principal crops, 1866-1917. January, 1919, p. 3.

Compared with farm prices, 1866-1915. February, 1917, p. 16.

Increasing, all crops. December, 1915, p. 78.

Index numbers, by States. November, 1916, p. 115.

Individual crops. (See "*Production*".)

In foreign countries:

Barley, oats, potatoes, rye, wheat. Yearbooks.

All countries for all years reported. Files of Division of Crop Records.

Normal, for principal crops. Once a year since 1911.

UNITED STATES DEPARTMENT OF AGRICULTURE,

Department Circular 151.

Bureau of Plant Industry

(New and Rare Seed Distribution),

WM. A. TAYLOR, Chief.

DISTRIBUTION OF COTTON SEED IN 1921.

This is the nineteenth distribution of cotton seed conducted by the Office of Seed Distribution in cooperation with the cotton-breeding investigators of the Bureau of Plant Industry.

During the past 17 years, approximately 50 varieties of cotton have been distributed. These have been developed by the experts of the Bureau of Plant Industry or selected by them because of special local value.

The method of distribution followed in the past few years has proved so generally satisfactory that it is proposed to continue it this season. The general distribution of a small quantity of seed (1 quart), to enable the farmer to become acquainted with the characteristics of the variety, will be followed in the most promising sections by a special distribution the following year, which is fully explained under the heading "Report of results of planting." This special distribution furnishes to those who submit favorable reports and sample bolls of the crop grown from the quart package of seed sufficient seed to produce at least one full bale of the new variety of cotton and also to produce a stock of seed for planting a considerable acreage the following season.

An introductory statement on "Improvement of the Cotton Crop by Selection," by O. F. Cook, who is in charge of the cotton-breeding work of this bureau, explains how the seed may be utilized to the best advantage by the farmer.

R. A. OAKLEY,
Agronomist in Charge.

SEPTEMBER 24, 1920.

IMPROVEMENT OF THE COTTON CROP BY SELECTION.

How can the farmer make the best use of a small stock of seed of a superior selected variety? By understanding and applying the methods by which select seed is produced, so as to keep the selected variety from deterioration. The usual way of treating a small quantity of select seed is not at all calculated to enable the farmer to learn the true value of a new variety or to preserve the purity of an improved stock.

TESTING NOT TO BE COMBINED WITH SELECTION.

A mistake made frequently by farmers, and sometimes by professional breeders, is to attempt to combine testing with breeding. The new variety of cotton is planted by the side of the local variety or a mixed stock in order to test its behavior, and seed is saved from the same planting to increase the stock of the new variety. This plan is open to the serious danger that the seed of the new variety when gathered in the fall will not be pure, on account of being contaminated by crossing with the local variety, so that its special value will be lost. The amount of crossing differs with the locality and the season, depending on the abundance of bees or other insects that carry the pollen from one flower to another, but there is usually too much crossing to make it safe to rely on the purity of any stock of seed that has been grown close to another variety of cotton.

ISOLATION OF SEED PLANTS.

A farmer who wishes to make a really adequate test of the value of a new variety should plant the seed in a separate plot, removed at least 300 yards from other fields of cotton or separated therefrom by 25 or 30 rows of corn. An isolated planting does not provide, of course, for a close comparison with the local variety, but this can be made in the following year to much better advantage. With the larger stock of seed then available a field planting can be made, as well as test plantings. In the third year there will be enough seed to stock even a large farm with the new variety, if it has shown itself superior under the local conditions.

Many farmers are unwilling to give the proper care to a new variety until they have made a preliminary test and convinced themselves that it is really superior. It is for this reason that the plan

of sending out a smaller quantity of seed in the general distribution has been adopted. Those who use this small sample of seed for testing purposes and plant it in the same field with another variety or a mixed stock of cotton are advised not to save seed in the fall with any idea that they are keeping a pure stock of the new variety in this way. If the farmer is convinced that the new variety is superior, he should get a fresh stock of the seed and plant it in a separate breeding plat, as far away as possible from any other field of cotton.

The distribution of seed of superior varieties of cotton is no longer limited to a single season, as the custom formerly was. Unless improved varieties become established in cultivation in some part of the United States the work of breeding and distribution serves no useful purpose. To increase the number of varieties in a community is not desirable. On the contrary, there would be a distinct advantage if the whole community would grow one variety, if the best variety could be determined. The danger of mixture of varieties by crossing and the mixture of seed at the gin would both be reduced, and the uniformity of the product would enable the community to secure a higher price for its cotton.¹

WHY SELECTION MUST BE CONTINUED.

Unless selection is continued, the value of a variety is sure to decline. A well-bred variety is superior to ordinary unselected cotton not only in having better plants but in having the plants more nearly alike. Whether selection has any power to make better plants is a question, but there can be no doubt of the power of selection to keep the plants alike. Even in the best and most carefully selected stocks inferior plants will appear, and if these are allowed to multiply and cross with the others the stock is sure to deteriorate. The pollen from the flowers of inferior plants is carried about by bees and other insects, and the seed developed from such pollen transmit the characters of the inferior parent. Even if they do not come into expression in the first generation they are likely to reappear in the second generation.

To grow cotton from unselected seed involves the same kind of losses as in an orchard planted with unselected seedling apple trees. Less cotton is produced and the quality is also inferior. The higher the quality of the cotton the more stringent is the requirement of a uniform staple. Unless the fibers have the same length and strength they can not be spun into fine threads or woven into strong fabrics.

¹ Some of the numerous advantages to be gained by a better organization of cotton-growing communities have been described in an article published in the Yearbook of the Department of Agriculture for 1911 under the title "Cotton Improvement on a Community Basis."

PRESERVATION OF VARIETIES BY SELECTION.

The method of selection to be followed in preserving a variety from deterioration is entirely different from that employed in the development of new varieties. The breeder of new varieties seeks for exceptional individuals and prefers those that are unlike any variety previously known. If the selection is being carried on to preserve a variety, the object is not to secure seed from the peculiar plants, but to reject all that deviate from the characters of the variety. The first qualification for such selection is a familiarity with the habits of growth and other characters of the variety, to enable the farmer or breeder to confine his selection to the plants that adhere to the "form" or "type" of the variety and to reject all that vary from the type. Most of the latter would prove to be very inferior and at the same time would increase the diversity of the variety and hasten its degeneration.

IMPROVED METHODS OF FIELD SELECTION.

No matter how good a new variety may be or how carefully it may have been bred and selected, inferior plants are likely to appear, especially when it is grown under new and unaccustomed conditions. A special effort is being made to limit the distribution to seed from uniform fields of cotton, but selection is necessary to keep any variety from deterioration, and it is inadvisable to wait until the deterioration becomes serious before beginning the selection. If proper attention be paid to the roguing out of inferior plants in the first season there may be much less variation in the second, the variety becoming better adjusted to the new conditions.

As uniformity is one of the first essentials of value in a variety, the behavior of a new variety in this respect is one of the first things to be noted. Do not wait till the crop matures, but watch the plants in the early part of the season. Even before the time of flowering it is possible to distinguish "freak" plants by differences in their habits of growth or the characters of their stems and leaves. Whenever such variations can be detected they should be pulled out at once, in order to prevent the crossing of the good plants with inferior pollen. After the bolls begin to reach mature size it is well to go through the plat again and pull out all plants that show by the small size or other peculiarities of the bolls that there had been a variation from the standards of the variety. These preliminary selections greatly simplify the final selection in the fall, when attention can be limited to the yield and to the characters of the lint and seeds.¹

¹ Methods of selection are treated in greater detail in Circular No. 66 of the Bureau of Plant Industry, U. S. Department of Agriculture, entitled "Cotton Selection on the Farm by the Characters of the Stalks, Leaves, and Bolls." See also Bulletin No. 159 of the Bureau of Plant Industry, U. S. Department of Agriculture, entitled "Local Adjustment of Cotton Varieties."

USE OF PROGENY ROWS IN SELECTION.

Selection can be made still more efficient by the use of progeny rows. The seed of select individual plants is picked separately into paper bags and planted the next season in adjacent rows, in order to test the behavior of the progenies of the different individuals. An inferior progeny can be rejected as a whole and selection limited to the best rows. It often happens that a very good plant produces a comparatively inferior progeny, which would not be excluded from the stock unless the progeny-row test were made.

Nevertheless the use of progeny rows is no substitute for skill and care in making the selection, for if the selected plants are not all of the true type of the variety admixture by cross-pollination will occur in the progeny rows the same as in a mixed planting. Protection against the danger of crossing between different progenies can be secured by holding over a part of the seed of the select individuals used to plant the progeny rows. The remainder of the seed that produced the best progeny row can be planted in an isolated breeding plat in the year following the progeny test. In this way a special strain is developed from a single superior plant.

METHODS OF TESTING COTTON VARIETIES.

The best way to test the behavior of two varieties of cotton is to plant them in alternate rows, so that they can be compared carefully during the growing season and the yield of each row weighed separately at the end of the season. Of course it is often possible to judge that one variety is superior to another without weighing, but if the results are nearly equal weighing is necessary. Even experienced cotton men are likely to make errors in guessing at the yields of different rows of the field. A variety that "scatters" its lint may appear to be yielding much more than a stormproof variety with dense, compact lint that can be shown to be much more productive by comparison of actual weights of seed cotton and percentages of lint.¹ The lint values are also to be compared, especially in long-staple varieties.

ADMIXTURE OF SEED IN GINS.²

One of the most serious difficulties in maintaining the uniformity of a superior variety of cotton is the mixture of seed in gins. A few

¹ See Circular No. 11 of the Bureau of Plant Industry, entitled "Danger in Judging Cotton Varieties by Lint Percentages," which may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents a copy. See also Bulletin No. 644, U. S. Department of Agriculture, entitled "Lint Percentage and Lint Index of Cotton and Methods of Determination."

² For a complete discussion of the admixture of seed in gins, see Bulletin 288 of the U. S. Department of Agriculture, entitled "Custom Ginning as a Factor in Cotton-Seed Deterioration," which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents a copy.

farmers have their own gins or small hand gins for their seed cotton, and in some localities ginning establishments are beginning to provide small gins that are kept clean for ginning seed cotton. Some farmers take care to avoid the mixture of seed by holding their seed cotton until the end of the season, when the time can be taken to clean out the gin. It is also possible to plant progeny rows or seed plats with unginced seed by wetting the lint before planting or by pressing the seed into moist ground.

O. F. Cook,
Bionomist in Charge.

VARIETIES DISTRIBUTED.

LONE STAR.

The Lone Star variety belongs to the Texas big-boll type and was bred in Texas by Dr. D. A. Saunders, of the Bureau of Plant Industry. It was developed from a single superior plant found in a field of Jackson cotton in the Colorado River bottom near Smithville, Tex., in August, 1905.

In 1908 plats of this selection large enough to give a fair test of yield and lint qualities under field conditions were planted at Waco, Denison, and Cuero, Tex. The yield, percentage, and quality of lint were better than in any other variety with which it was compared, and this superiority has been retained in subsequent seasons.

The following is a technical description of this variety:

Plant of medium height with one to four limbs and many long fruiting branches; main stem very short jointed and less hairy than most of the big-bolled varieties; the limbs ascending, generally producing fruiting branches at their base; fruiting branches numerous, horizontal or ascending, long, medium-short jointed; leaves medium to large, very dark green; petioles very long, somewhat drooping or recurved; bolls very large, round or broadly ovate, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches in diameter, $1\frac{3}{4}$ to 2 inches in length, with very short, blunt points, 35 to 45 to the pound; involucre bracts very large, closely appressed, coarse veined, deeply cut into long teeth, the longest teeth often meeting over the end of fully developed green bolls; pedicels of medium length, $1\frac{1}{2}$ inches in length below to three-fourths of an inch at the top of the main stem and the extreme ends of the primary and fruiting branches; the bur thick and heavy, with very blunt points; lint 1 inch to $1\frac{1}{8}$ inches in length, very strong, and of uniform length of fiber, 38 to 40 per cent.

In this variety the limbs begin to develop fruiting branches 4 to 7 inches from their bases instead of near their extremities. This appears to be an advantage under weevil conditions, as in years of heavy infestation the bulk of the crop must be obtained from the lower third of the plant. In selection, considerable stress has been laid upon the short-jointed character of the main stem as essential in developing an early-fruiting tendency. The habits of growth are similar to those of the well-known Triumph cotton, and under some conditions the two varieties appear almost indistinguishable; but in other places obvious differences appear, and these are in favor of the Lone Star. The plants are less inclined to become prostrate, the bolls are larger, and the lint longer and more abundant. Very large yields have been reported—more than two bales per acre on measured areas. Under favorable conditions the fiber attains $1\frac{1}{8}$ inches in length.

Many bales of this cotton have been sold at a premium. The Lone Star is undoubtedly the best variety now available for general planting in the Texas black-land belt and adjacent regions. The variety is being grown extensively in Texas, Oklahoma, and Arkansas.

The seed for this distribution was grown for the Department of Agriculture by Mr. R. W. Christian, Manchester, N. C., and Dr. D. A. Saunders, Greenville, Tex.

TRICE.

The Trice cotton is an early-maturing short-staple variety developed by the late Prof. S. M. Bain, of the Tennessee Agricultural Experiment Station, a collaborator of the Bureau of Plant Industry. It is the result of four years' selection from an early variety found on the farm of Mr. Luke Trice, near Henderson, Chester County, Tenn. The original variety is said to have come from southern Missouri and is known locally in Chester County as Big-Boll Cluster. In the work of selection particular attention was given to earliness, productiveness, form of stalk, and large bolls, the crops being produced on the farm of Mr. W. N. McFadden, in Fayette County, Tenn. A trial made alongside the original variety in 1908 showed a distinct improvement in all the qualities sought in the selection, as well as greater uniformity.

Though developed with special reference to the light, sandy soils of western Tennessee, the variety has given excellent returns in other districts. The most active demand for the seed has come from northern Mississippi, where the invasion of the boll weevil has led to the planting of earlier varieties; but the variety has also proved valuable in other districts not yet invaded by weevils, for it is distinctly superior to King and other varieties prized for extreme earliness.

The Trice cotton is thus described:

Plant rather small, 2 to 5 feet high, of Peterkin type, rarely with distinct basal branches, very prolific; fruiting branches numerous, short jointed; leaves light green, of medium size, hirsute; bolls medium to large, ovate, often angular, 4 to 5 locked; seed large, with dense whitish or brownish fuzz; lint fine, seven-eighths to 1 inch long; percentage of lint, 28 to 33; season early.

This variety having been developed from a cluster type, this character is liable to reappear. The percentage of reversion apparently is greater under more adverse soil conditions. In maintaining the variety, cluster plants should be removed from the field as early as possible.

The seed now distributed was grown by Mr. A. R. Bridger, Bells, Tenn.

COLUMBIA.

The Columbia cotton is an early long-staple variety, well adapted to South Carolina and adjacent States. It was derived from a short-staple variety, the Russell Big Boll. The first selection was made in 1902 at Columbia, S. C., by Dr. H. J. Webber, formerly in charge of the cotton-breeding work of the Bureau of Plant Industry, and resulted in the finding of a single long-linted plant that gave a superior progeny in 1903. Throughout the process of selection the aim was to select plants having the Russell type of branching and boll, so that the plant of the Columbia is scarcely recognizable as distinct from the Russell variety. The very large boll has also been retained, and the variety is in every respect of true Upland type aside from the length of lint and the color of the fuzz.

The Russell variety produces a large seed covered with dark-green fuzz. This character is very undesirable, owing to the discoloration of the lint if ginned while somewhat wet by the pulling off of the green fuzz and also owing to the green color giving undesirable linters. In breeding this variety by selection, therefore, special attention has been given to selecting a white seed. The great majority of the plants of the Columbia variety now produce white seed, but this character has not as yet been entirely fixed and some green seed continues to be produced. There is also a tendency to produce occasional plants with greenish lint. These should be rejected in picking, as the lint is worthless and produces an undesirable discoloration in the bale. The proportion of green seeds is much larger in some seasons than in others, owing to some influence of external conditions not yet understood.

The following is a technical description of this variety:

Plant low, compact, of Russell type, having several long, branching basal limbs, vigorous, prolific; bolls large to very large, ovate, short pointed, opening well, mainly 5 locked; seeds large, fuzzy, white or greenish, 8 to 10 per lock; lint very strong, from $1\frac{1}{4}$ to $1\frac{7}{8}$ inches in length, fine, silky, and very uniform in length; percentage of lint, 29 to 33; season early in comparison with the older long-staple varieties.

As a result of continued high prices for long-staple Upland cotton, Columbia cotton is being quite extensively planted in South Carolina and adjacent States.

The Columbia cotton is increasing rapidly in popularity and in some neighborhoods has become the dominant variety. Growers accessible to long-staple markets usually secure a premium of 5 cents or more above corresponding grades of short-staple cotton. Contrary to the general impression that long-staple varieties are unproductive, the Columbia cotton often outyields short-staple varieties grown under the same conditions. The danger now is that failure to keep the seed pure will result in the production of large

quantities of uneven fiber that will injure the reputation of the variety. Hence the importance of continued distribution of select seed. It is also important that communities undertaking to produce long-staple cotton should provide themselves with facilities for maintaining the uniformity of select varieties.

In order to secure a premium, especially for long staple, it is necessary to pick the cotton with care, not only to exclude leaves and other "trash" but to avoid immature and weather-stained bolls. It is also necessary that the cotton be dry before ginning.

In some localities it is believed that the Columbia cotton suffers more than the other varieties from the rotting of the bolls through attacks of anthracnose or from other causes. These dangers are increased when conditions favor such luxuriant development of foliage that the bolls are kept moist by heavy shade. The planting of Columbia cotton in Texas is not advised, though excellent results are reported from some localities in the coast belt. The good qualities of the variety are not retained under the more extreme conditions that are often encountered in the drier regions of the Southwest.

The seed for this distribution was grown by Mr. C. H. Carpenter, Easley, S. C.

DURANGO.

The Durango is a new type of Upland long-staple cotton, introduced and acclimatized by the Department of Agriculture. It has been derived from a Mexican stock, supposed to have come from the State of Durango. The seeds used for the first planting were taken from a few bolls obtained by Mr. F. L. Lewton from an exhibit made by the Mexican Government at the St. Louis Exposition. After several years of acclimatization and selection in southern Texas a superior strain was separated, from which the present Durango variety has been developed.

The results of numerous experiments justify the recommendation of Durango cotton as an early productive variety adapted to a wide range of conditions in the United States. It has given better results than other long-staple varieties in the irrigated regions of the Southwestern States, as well as in Upland districts of the Southeastern States. In experiments as far north as Norfolk, Va., yields have been secured comparing favorably with King and other early-maturing short-staple varieties. In the Imperial Valley of California the Durango cotton has outyielded the short-staple varieties, as well as producing lint of much higher value. It is grown in several of the irrigated southwestern valleys.

In earliness the Durango cotton is distinctly superior to the Columbia, which is an advantage in weevil-infested regions or where the season is short.

The lint is of excellent quality and attains a length of $1\frac{1}{4}$ inches under favorable conditions. The bales of Durango cotton thus far produced have been sold at from 2 to 10 cents a pound above the prevailing market prices of short-staple cotton, premiums of 5 or 6 cents being the rule.

The following is a short technical description of this variety:

Plant of upright habit, with a strong central stalk and rather stiff, ascending vegetative branches. Fruiting branches of moderate length or rather short, under some conditions becoming semiclustered. Foliage rather deep green, reddening rather early in the season. Leaves of medium size, usually with five or seven rather narrow tapering lobes, leaves with three lobes being less frequent than in most other varieties of Upland cotton. Involucral bracts rather small, triangular, cordate, margined with rather short teeth. Calyx lobes rather irregular in length, sometimes very long and slender. Bolls of medium or rather large size; under favorable conditions about 60 to the pound. Shape of bolls, conic oval, with rather smooth surface, the oil glands deeply buried. The proportion of 5-locked bolls varies usually from 40 to 50 per cent. Seeds of medium size, covered with white fuzz and bearing abundant even lint about $1\frac{1}{4}$ inches long under favorable conditions. Lint percentage, 32 to 34.

More complete accounts of the characters and habits of the Durango cotton in comparison with those of other varieties are to be found in several of the publications of the Department of Agriculture.¹

The seed for this distribution was grown by Mr. W. E. Hotchkiss, Courtland, Ala.

MEADE.

The Meade is an Upland variety of long-staple cotton. The present stock has been developed from a few exceptionally desirable plants that were discovered in 1912 by Mr. Rowland M. Meade, of the Bureau of Plant Industry, in a field near Clarksville, Tex. It has not been possible to trace definitely the origin of the parent stock. The local information indicated that it had been brought from Arkansas several years before and was not grown extensively in Texas. It was called rather indiscriminately "Black Rattler," or "Blackseed," but does not correspond with descriptions of either of the varieties known by those names in other districts. Mr. Meade was the first to appreciate the possibilities of breeding a superior type from this stock, and the work was well under way at the time of his death in June, 1916. The variety has been named Meade in his honor.

As now grown in the Southeastern States, the Meade variety has lint averaging $1\frac{1}{2}$ inches in length. The fibers are exceptionally uniform, with little or no tendency to shortened lint at the base of the

¹ See U. S. Department of Agriculture, Bureau of Plant Industry Bulletin No. 220, entitled "Relation of Drought to Weevil Resistance in Cotton," and Farmers' Bulletin 501, entitled "Cotton Improvement under Weevil Conditions."

seeds. The seeds are large and brownish black, being only slightly tufted with white fuzz at either end. Under boll-weevil conditions in Georgia the Meade has given excellent results, yielding three to four times as much as the Sea Island cotton when planted in alternate blocks so that careful comparisons could be made. The lint has been received on the Sea Island markets of Georgia in competition with Sea Island cotton with very favorable comments. Several bales of the Meade were sold in Savannah in 1917 at a premium of half a cent above the current price of Sea Island cotton.

The Meade differs from other Upland long-staple varieties in its very close resemblance to Sea Island fiber of the character that has been produced in Georgia and Florida and in the fact that its smooth seeds adapt it for ginning on the roller or "long-staple" gin, so that no radical changes are required in the substitution of the Meade for Sea Island cotton. The work of selection to maintain the purity and uniformity of the stock is being continued in cooperation with several communities in Georgia and South Carolina.

The following is a description of the variety:

Plant erect, of average height with regular internodes of medium length on both the main stalk and on the vegetative branches. Internodes of the fruiting branches rather long, with little tendency to take the shortened "cluster" form. Leaves of medium size and rather thin texture, not deeply cut, a larger proportion with only three lobes than in most varieties. Involucral bracts of medium size, not exceeding the bolls, with 10 slender teeth. Bolls medium size with a thin bur, opening readily even under humid conditions. Seeds large, about 3,000 to the pound, nearly naked after the lint is removed, brownish black, slightly tufted at either end. Lint $1\frac{1}{2}$ to $1\frac{1}{8}$ inches in length, uniform, with good luster, slightly heavier bodied than Sea Island cotton, scarcely distinguishable from Sea Island when properly ginned. Lint percentage, 26; lint index, 5.5.

In a comparison of alternate blocks of Meade and Sea Island cotton grown near Valdosta, Ga., in the season of 1917, the Meade was picked two weeks in advance of the Sea Island and yielded almost twice as much, 230 pounds as compared with 117 pounds. Picking is easier because the Meade bolls are about twice as large as the Sea Island. Ten 4-locked bolls of the Meade variety yielded 65.7 grams of seed cotton compared with 35.7 grams from ten 4-locked bolls of Sea Island, but 75 per cent of the Sea Island bolls have only three locks. The Meade has 75 per cent of 4-locked and 25 per cent of 5-locked bolls. On account of the larger size of the seeds the lint percentage is lower in the Meade than in Sea Island cotton—at Valdosta 26.8 per cent for the Meade and 30.7 for Sea Island. This is at the rate of 1,365 pounds of seed to a 500-pound bale of Meade, compared to 1,111 pounds of seed from a 500-pound bale of Sea Island cotton. The oil content of the Meade seed is unusually high, about 24 per cent having been reported. Both varieties yielded fiber of the same length, $1\frac{5}{8}$ inches.

In order to be a successful competitor with Sea Island cotton on the Sea Island markets it is necessary that the Meade cotton be harvested and ginned in the same manner and with care equal to that with which Sea Island is usually handled. The fact that the plants have the same general appearance and behavior as short-staple Upland varieties affords no justification for careless handling of the fiber.

ACALA.

This variety, like Durango, has been developed from imported seed and represents a new form of Upland cotton previously unknown in the United States. The original stock was obtained by Messrs. G. N. Collins and C. B. Doyle, of the Department of Agriculture, at Acala, in the State of Chiapas, in southern Mexico, in December, 1906, as the result of an expedition sent out for this purpose, the existence of a native big-boll type of cotton in southern Mexico having been discovered during a previous expedition conducted by Mr. O. F. Cook.

The preliminary work of acclimatizing and selecting desirable strains from the Acala stock was carried on chiefly in southern Texas in the years between 1907 and 1911. In 1911 the variety was planted for the first time on a field basis at Waco, Tex. During the last six years it has given very satisfactory results in several localities in Texas, Oklahoma, and western Tennessee. It has attracted very favorable attention in Oklahoma as a large-bolled cotton earlier than Lone Star or Triumph, producing a similar abundance of lint with a somewhat longer staple.

The present strain, adapted to northern conditions, is from a selection of 20 plants made by Dr. D. A. Saunders from the original field grown at Waco in 1911.

The variety may be described technically as follows:

Plant of medium height, with strong, erect main stem. Wood limbs or primary branches few, erect or ascending. Fruiting branches short jointed, zigzag, the lower branches long, becoming very short above, giving the plant a semiclustered appearance. Leaves of medium size, dark green, those of the main stalk usually with five lobes, on the fruiting branches three lobes; the lobes long and very sharp pointed, resembling those of the Durango. Bolls medium size— $1\frac{1}{2}$ inches or longer—ovate or ovate-oblong with a rather short blunt point; 50 to 60 to the pound. Involucral bracts rather small for an American variety, rarely reaching more than half the length of the mature bolls; teeth long and narrow and somewhat scythe shaped, often interlacing over the buds. Pedicels of medium length— $1\frac{1}{2}$ inches—burs often pendent, of medium thickness, storm-proof, opening wide. Lint $1\frac{1}{8}$ to $1\frac{3}{8}$ inches, usually $1\frac{1}{2}$ full, with good drag and extra strong; clear white without creamy tint. Percentage of lint, 32 to 35.

In the shape of the plant, the type of boll, and especially in the quality of the lint, Acala is distinct from all other varieties and is one of the most striking sorts thus far introduced. It meets a dis-

inct agricultural need in maturing somewhat earlier than Lone Star or other big-boll cottons. On this account it promises to be rapidly extended in cultivation in parts of northern Texas and Oklahoma. It is already well known in some communities, and local cooperators and breeders are finding a ready sale for the seed, sometimes calling it "Kelly." Its earliness in these sections makes it especially adapted to the bottom lands, where cotton tends to grow rank and be late in maturing, and on the more northern highlands where frost shortens the growing season. It is particularly noted also for the good drag and the extra strength of its fiber. In the long-staple market Acala brings a premium of \$7.50 to \$12 a bale.

The seed for this distribution was obtained from Mr. Ferris D. Watson, Waxahachie, Tex.

REPORT OF RESULTS OF PLANTING.

Inclosed with the quart package of cotton seed sent for the preliminary trial will be found a yellow return card showing the variety of the seed sent, which is to be returned to the Department of Agriculture in case the grower is willing to cooperate in testing the comparative value of this variety. To those returning this yellow card, a blank form will be sent in the fall of 1921 for use in giving a detailed report of the results obtained, including the following items:

- (1) Character of the soil.
- (2) Character of the season.
- (3) Whether the seed of the new variety was isolated or planted with a local variety for comparison.
- (4) Name of local variety used for comparison.
- (5) Size and yield of row or plat for the new variety.
- (6) Yield of equal row or plat of the local variety.
- (7) Rating of the new variety for your section—whether excellent, good, fair, or poor.
- (8) A sample of seed cotton representing ten 5-locked bolls, the seed cotton from each boll to be picked carefully and wrapped separately in a small piece of paper.

Should the report of the preliminary test prove to the Department of Agriculture that the variety is desirable for the grower's conditions and if a 10-boll sample of the seed cotton is submitted in accordance with instructions, he will be permitted to share in the special distribution of half-bushel lots of seed of the same variety the following season.

In order to take advantage of this special distribution it will be necessary for the grower to keep careful notes of the behavior of the plants grown from the quart package of seed, so that a complete report can be made on the blank which will be sent for that purpose.

The sample bolls are to be used for determining the length, quality, and percentage of lint. This information, together with the detailed report, will enable the cotton experts of the Department to decide whether the variety is promising under the grower's conditions and will aid in assigning the distribution of the larger lots of seeds to such communities only as are likely to adopt the new varieties and establish them in regular cultivation.

The samples should be accompanied by the name and address of the grower, as well as the name of the variety grown. In previous years it has been necessary to discard many samples because they were not marked and there was no way to identify them.



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